Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, October 21, 2015 10:27 AM
To: 'Sygo, Jim (DEQ)'
Subject: RE: I got your vm. No problem. Thanks

Hi Jim,

The Task Force will send you comments by Noon your time today. Pleased to discuss if you'd like to.

Thanks.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Tuesday, October 20, 2015 6:39 PM
> **To:** Kaplan, Robert
> **Subject:** Re: I got your vm. No problem. Thanks
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> Okay
>
> Sent from my iPhone
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> On Oct 20, 2015, at 6:49 PM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:
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> > No need to talk tonight. We are close. Let's get together tomorrow (Wednesday). - Bob
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> > U.S. EPA Region 5
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> > Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, October 21, 2015 11:39 AM
To: Kaplan, Robert
Subject: RE: I got your vm. No problem. Thanks

Okay. Thanks Bob.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Wednesday, October 21, 2015 12:05 PM
To: Sygo, Jim (DEQ)
Subject: RE: I got your vm. No problem. Thanks

We've been delayed by a bit. Will send you final at about 1:00 p.m your time.

Thanks. - Bob

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Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, October 21, 2015 11:47 AM
To: 'Sygo, Jim (DEQ)'
Subject: Flint Task Force comments -- MDEQ Draft Sampling Document
Attachments: EPA Comments on MDEQ Draft Sampling 10-21-15 (FTF 15-1)

Hello Jim,

As we discussed, attached please find the EPA Flint Task Force comments on the MDEQ Draft Sampling Document.

- Bob

Flint Safe Drinking Water Task Force (FTF 15-1)

Flint Safe Drinking Water Task Force Comments on MDEQ Draft Protocol for Collecting Water Samples at Schools for Lead Analysis

EPA received the latest draft of MDEQ's "Protocol for Collecting Water Samples at Schools for Lead Analysis" for comment from Liane Shekter-Smith on October 19, 2015. Below are comments from EPA's Flint Safe Drinking Water Task Force.

General

There is an understandable urgency to assess the situation in schools, but an equally important consideration should be the ability to assess whether progress is being made over time as treatment is introduced and monitored. It is critically important that everyone understand how to collect samples from the different types of outlets, how to interpret the sample results (i.e., what the results mean and what they don't mean) and how to effectively communicate the results to the public.

Additionally, there is always confusion over what threshold lead levels should be used and what the numerical sampling results mean. It is very important that everyone involved in the sampling and communication have proper training so that accurate information is provided to the public from the beginning. EPA's recommendation is that training be provided by ORD as soon as possible to the health department and others that are involved before the school sampling begins. It would also be good to provide the same entities an overview on corrosion and corrosion control so that the objectives of the sampling and capabilities/limitations of the treatment are properly understood by all.

Sampling protocol

The proposed end-point sampling is useful and can provide information on whether end-point devices should be replaced. Relying solely on the proposed sampling to evaluate the safety of the water in the plumbing overall is not possible. It is essential to have proper baseline data from throughout the school plumbing, not just the endpoints, to assess the risk as well as the progress of treatment. The best sampling protocol for that would be sequential sampling conducted at 2 or 3 locations in each school. The sequential sampling results would enable an ongoing assessment of the effectiveness of treatment throughout the plumbing network over time. This type of an assessment is not possible to do with single samples. Certainty is very important at this stage.

Timing of Sample Collection

If the purpose of the sampling is to identify the sources of lead in the plumbing system and also to identify potential exposure, the timing of the sample collection is important. Do the schools have a program to flush all drinking water consumption taps and coolers and bubblers on the first day back in school after weekends, vacations, etc.? If they do not, the sampling will miss the worst potential exposure for the first few kids drinking the water.

The proposed timing in the protocol indicates that samples should not be collected followed an extended stagnation, such as a weekend. This limitation is more appropriate for samples collected from residences as this does not reflect normal household use. MDEQ should consider collecting samples on different days of the week to get an idea of the conditions throughout the

week. Samples from one or some of the locations taken on Monday mornings would represent the 'worst-case' lead levels found under normal conditions that the children would be exposed to as the water routinely stagnates in the plumbing each weekend that school is in session. Collecting samples during this time would provide more consistent 'worst-case' data under normal usage for evaluating the effectiveness of remedial efforts. Samples could then be taken on a Wednesday and on a Friday under different water use conditions.

On-Site Assessment

The protocol should state that the assessment should record any model number of faucets, valves, etc. that are accessible to inspection, with digital photos included, if possible. Some might be behind walls, but others may be just under sinks, bubblers, etc. This is important in identifying and interpreting the 125 mL samples. If potential brass devices are seen that would not be captured in the 125 mL sample, they should be noted, or an option added to include a 2nd sequential sample for the first draw, if appropriate.

The On-site Assessment should also identify if there is any water treatment being done in the building, i.e., POU or POE.

The second bullet under Step 1 asks about buildings built after 1986 and whether lead-free plumbing and solder was used. Keep in mind that the definition of lead-free was revised in 1996 and again in 2011. Most, if not all, 1986 brass/bronze plumbing fittings and fixtures would fail to meet the current lead-free requirements.

Under Step 5 – Prior to Sample Collection, there is a recommendation to flush the taps the afternoon prior to sampling because drinking water has not been consumed from them for several weeks. This seems to be equated with no use, which may apply to the water coolers and bubblers if shut off, but may not apply to kitchen taps (dish/pot cleaning) and bathroom taps (hand washing). Also, the instruction to school personnel should specify how many minutes to run the tap the day before sampling rather than "several minutes".

Sampling Volumes

Two sequential small volume samples at the beginning is preferable, just to have a better idea of the detail of multiple sources of lead in the proximity of the outlet. It sometimes would save a trip back to collect more samples if there is a high hit in the one sample. If you do the 125 mL only, the identification of plumbing fittings and fixtures in the On-site Assessment will help identify potential sources of lead in the case of a high hit.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Thursday, October 22, 2015 8:16 AM
To: Kaplan, Robert
Subject: RE: I got your vm. No problem. Thanks

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Jim, thanks. I will get right back to you with a proposed time and call in info.

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Sent: Thursday, October 22, 2015 4:39 PM
To: Kaplan, Robert
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Bob,
There appears to be agreement on the optimization of corrosion control for the City of Flint. This is the note provided to me by staff after a discussion with members of your task force.

From: Busch, Stephen (DEQ)
Sent: Thursday, October 22, 2015 12:58 PM
To: Schock, Michael; Lytle, Darren
Cc: Kempic, Jeffrey; Prysby, Mike (DEQ); kaplan.robert@epa.gov; Krisztian, George (DEQ); Sygo, Jim (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

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The City of Flint will need to supply a similar phosphoric acid product, NSF Standard 60 approved with allowable maximum dosage.

DWSD supplied water is currently dosed at 0.39 mg/L as P (1.2 mg/L as PO4) slightly above DWSD's OCCT requirement to dose a minimum of 0.9 mg/L as PO4 and have a minimum plant tap residual of 0.8 mg/L as PO4. DWSD plant tap residuals have been shown to consistently be at 0.39 mg/L as P (1.2 mg/L as PO4). In addition water supply entering Flint has been tested and so far shown to contain approximately 0.39 mg/L as P (1.2 mg/L as PO4) as well.

To achieve pipe passivation Flint will boost orthophosphate dosage to establish a minimum distribution residual of 1.0 mg/L as P (3.1 mg/L as PO4). The chemical feed system will be sized to achieve a dose up to 2.0 mg/L as P (6.1 mg/L as PO4) in case orthophosphate loss is observed.

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EPA ORD staff will provide instructions to the City of Flint for creating test loops to help confirm effectiveness of the corrosion control treatment. This data will help in rebuilding public trust.

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treatment. Procedures recommended by EPA should be shared with the Michigan Department of Health and Human Services.

The University of Michigan in Ann Arbor had previously expressed interest in assisting the City of Flint. Both the Department of Civil and Environmental Engineering, and School of Public Health should be contacted to determine if that interest still exists with potential to assist in both test loop construction and monitoring, and exposure assessment monitoring in homes. Any water analysis should occur at a certified laboratory.

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The City's engineering consultant will need to evaluate KWA water in conjunction with the City of Flint treatment plant processes to determine any necessary adjustments in optimized corrosion control treatment prior to initiating service to customers. Full scale testing may not be feasible.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov

From: Lytle, Darren [mailto:Lytle.Darren@epa.gov]
Sent: Monday, October 19, 2015 12:05 PM
To: Prysby, Mike (DEQ)
Cc: Schock, Michael; Kempic, Jeffrey; Busch, Stephen (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Mike,

Thank-you for giving us the opportunity to review the city of Flint's corrosion control plan.

We believe it is necessary that Flint boosts orthophosphate dosage. Given that the distribution system has not received orthophosphate in over a year, we expect that orthophosphate will need to be boosted to 1) meet the demand of the distribution system, 2) reach the service lines and other lead-containing components in premise plumbing, and 3) accelerate lead reduction at the consumer's taps. Orthophosphate should preferably be added in the same form as the Detroit source which is phosphoric acid from our understanding. This is the proposed case here, however, a simple test should be performed to make sure that the pH is not impacted in a significant way at the desired target dose.

We have not been able to obtain comprehensive water quality data for the finished water characteristics of the Detroit water that will be fed to Flint, to assess ranges of major chemical characteristic fluctuations. However, based upon the email trail, Detroit water entering the Flint system appears to only contain around 0.4 PO4/L. This concentration range is entirely too low compared to that needed in studies presented and published in the last 20+ years that have focused on lead released directly from lead pipes, and the solubility of the most likely lead orthophosphate pipes scales. We also

strongly feel that targeted dose of 0.8 mg PO4/L is also too low, for the very same reason. We would be glad to share with you numerous standard corrosion control and treatment reference works, best practices guides and published results from US and international lead corrosion control field and pilot studies. Secondly, the basis for that target (other communities using Lake Huron source use the same dose) is not scientifically derived nor does it consider water quality and the current state of Flint's distribution system. We have reviewed the original Detroit corrosion study and have seen some of the LCR monitoring data, and besides the fact that it did not directly pertain to this water source, few dosages were tested in the cited 1994 pipe loop study, and the higher dosage than the one implemented in the field currently was more effective. Based on the limited amount of data on the quality of Detroit water, what we know about the history of Detroit corrosion control, we think an orthophosphate residual of 3 to 4 mg PO4/L should be the minimum starting test target residual for pipe passivation. It is likely that, at least initially a higher dosage will be necessary to reach the far ends of the distribution system and sufficiently reduce lead solubility and release from all lead sources. To allow flexibility, we feel the design of the chemical feed and storage systems should be able to consistently deliver a maximum dose of 5 to 6 mg PO4/L, if substantial orthophosphate loss is observed, if the starting dose is set for the desired residual level of 3 to 4 mg/L as PO4. We suggest that jar tests be performed in advance of orthophosphate addition to Detroit water to evaluate the impact of orthophosphate dose on turbidity that could result from interactions between orthophosphate and background Detroit water quality parameters (e.g., aluminum, calcium, etc.).

We want to stress that immediately shifting to Detroit water and adding orthophosphate will not necessarily translate to immediate improvements. Furthermore, this is a change, albeit a return to past conditions. Nonetheless, a period of system upset should be anticipated. The need for a communication strategy and a distribution system plan are critical.

Lastly, we see no mention of a water quality monitoring program. Two programs need to be put in place immediately (before return to Detroit water) to 1) identify lead sources, 2) assess treatment effectiveness against lead release from all of the simultaneously operating mechanisms (solubility, particulate release, galvanic corrosion), and 3) assess orthophosphate levels and stability of water quality in the distribution system.

There are multiple sources of lead in the Flint distribution system to the consumers' taps, such as: pipes; leaded brass; leaded solder; accumulations on old galvanized steel pipes; possibly accumulated on copper or some plastic pipes. It is critical that the fate of orthophosphate in the distribution system is understood, and how effective it is against each type of lead source, so dosing adjustment can be properly made. For this purpose, we recommend that a number of residences throughout Flint that meet the following plumbing criteria, be identified for an assessment of the contribution lead from the different potential service line and interior plumbing sources, through detailed mapping of plumbing materials, lengths, sizes, and location and type of inline devices and faucets using profile sampling. For confidence in interpretation, probably at least 5 sites from each of the configurations will be necessary. The configurations we would estimate to be most important (but should be changed or added to if local construction practice indicates it's necessary): Lead service line, galvanized steel interior plumbing; lead service line, copper with leaded solder joints; lead service line, plastic interior plumbing. It is also possible that interior plumbing may differ from the material used for the customer-side service line segment. We would be glad to discuss the specifics of this sampling effort.
For the purpose of assessing stability of water quality in the distribution system and to inform on orthophosphate residual adjustment, we suggest that 8 to 10 locations in the distribution system be selected to measure pH, alkalinity, orthophosphate, turbidity and iron on a weekly basis. These could be collected from TCR sampling locations, or other readily-accessible buildings, should be located at a distribution of locations in the distribution system and should be collected after a flush sufficiently long to assure that "fresh" distribution system water is being measured. Research has shown that over time, orthophosphate can reduce disinfectant demand associated with corroding metallic distribution system materials. These measurements need to be performed in the field and can simply be done with a portable HACH test kit or spectrophotometer.

A lead sampling plan needs to be in place to access the effectiveness of water change and treatment boost. LCR monitoring sites with confirmed lead service lines can be in the sampling pool. Sampling should consist of a 1 liter first draw sample (LCR sample without 5 minute pre-flush), followed by an additional flushed sample or two depending on profile sample results which is intended to capture major lead source(s). The specific details of this effort need to be

worked out by the technical committee as soon as possible. We would gladly work with Flint on establishing a water sampling program to identity and verify lead service line sites. The plan and initial sampling effort should be performed before the switch so that one baseline sample set is collected.

Lastly, our strength does not fall under full-scale pump and chemical feed delivery systems. We would only say that the systems need to be scaled-up in size to accommodate our suggested dosing needs. Also, there is the some discussion about diverting water to the Dort reservoir and an associated orthophosphate feed system. We are not familiar with the reservoir but are wondering if it is an open reservoir?

Of course this is a lot of information to share and we would gladly be available to discuss the technical and scientific basis for our suggestions.
Let us know if you have any questions and thanks again,

Darren and Mike

Darren A. Lytle, Ph.D., P.E.
Branch Chief (Acting)
U.S. Environmental Protection Agency
26 West Martin Luther King Dr.
Cincinnati, Ohio 45268
Phone: (513) 569-7432
Fax: (513) 487-2543
email: lytle.darren@epa.gov

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Friday, October 16, 2015 1:32 PM
To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>
Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Darren, Michael

We have received Flint's corrosion control proposal from their consultant. If you have comments, please provide them to me by Monday morning.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

From: Matta, Samir [mailto:SFMatta@lan-inc.com]
Sent: Friday, October 16, 2015 12:02 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

Please see attached plans for the Corrosion Control Plan for the City of Flint. I will have the official submittal package to you tomorrow afternoon after I get Brent or Mike's signature on the permit application. I will call you when I get back in Lansing to drop the package. Is three sets of full size plans adequate? Would you like some half size plans? Let me know.

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4. Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that, at least initially, there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.
The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Please let me know if the information is adequate or you require additional information.

Thanks.

Samir F. Matta, PE
Team Leader

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Sent: Friday, October 23, 2015 9:37 AM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Jim,

Thanks for the note. There does appear to be agreement. I will confirm that with the Task Force team members today just to make certain we haven't missed anything.

This is good news. I'm glad we're moving quickly, and working together. The Task Force will discuss the "test loops" and make sure we have agreement on the protocol.

I'm setting up a call for next week to discuss this weekend's school sampling effort.

- Bob

Robert Kaplan
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To: Prysby, Mike (DEQ)
Cc: Schock, Michael; Kempic, Jeffrey; Busch, Stephen (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

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Nonetheless, a period of system upset should be anticipated. The need for a communication strategy and a distribution system plan are critical.

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Of course this is a lot of information to share and we would gladly be available to discuss the technical and scientific basis for our suggestions.
Let us know if you have any questions and thanks again,

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Darren A. Lytle, Ph.D., P.E.
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U.S. Environmental Protection Agency

26 West Martin Luther King Dr.
Cincinnati, Ohio 45268
Phone: (513) 569-7432
Fax: (513) 487-2543
email: lytle.darren@epa.gov

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Friday, October 16, 2015 1:32 PM
To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>
Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

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District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

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Please let me know if the information is adequate or you require additional information.

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Samir F. Matta, PE
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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 23, 2015 11:39 AM
To: Kaplan, Robert
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

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Criteria for deeming the treatment optimized must be established as the LCR only requires compliance with the lead and copper Action Levels once this determination has been made.

The City of Flint is continuing to digitize service line index card records into a Geographic Information System to confirm the location of lead service lines. EPA can provide additional information to the City regarding a sampling procedure to verify lead service line sites.

The City's engineering consultant will need to evaluate KWA water in conjunction with the City of Flint treatment plant processes to determine any necessary adjustments in optimized corrosion control treatment prior to initiating service to customers. Full scale testing may not be feasible.

Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov

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Kaplan, Robert

From: Kaplan, Robert
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To: 'Sygo, Jim (DEQ)'
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The main purpose of the EPA Task Force is to ensure that EPA is speaking with a single voice, and there is a single point of entry to EPA for technical support.

Happy to discuss today or any time!

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Stephen Busch, P.E.
MDEQ Lansing District Coordinator
Office of Drinking Water and Municipal Assistance
Lansing and Jackson District Supervisor
517-643-2314
buschs@michigan.gov

From: Lytle, Darren [mailto:Lytle.Darren@epa.gov]
Sent: Monday, October 19, 2015 12:05 PM
To: Prysby, Mike (DEQ)
Cc: Schock, Michael; Kempic, Jeffrey; Busch, Stephen (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Mike,

Thank-you for giving us the opportunity to review the city of Flint's corrosion control plan.

We believe it is necessary that Flint boosts orthophosphate dosage. Given that the distribution system has not received orthophosphate in over a year, we expect that orthophosphate will need to be boosted to 1) meet the demand of the distribution system, 2) reach the service lines and other lead-containing components in premise plumbing, and 3) accelerate lead reduction at the consumer's taps. Orthophosphate should preferably be added in the same form as the Detroit source which is phosphoric acid from our understanding. This is the proposed case here, however, a simple test should be performed to make sure that the pH is not impacted in a significant way at the desired target dose.

We have not been able to obtain comprehensive water quality data for the finished water characteristics of the Detroit water that will be fed to Flint, to assess ranges of major chemical characteristic fluctuations. However, based upon the email trail, Detroit water entering the Flint system appears to only contain around 0.4 PO4/L. This concentration range is entirely too low compared to that needed in studies presented and published in the last 20+ years that have focused on lead released directly from lead pipes, and the solubility of the most likely lead orthophosphate pipes scales. We also strongly feel that targeted dose of 0.8 mg PO4/L is also too low, for the very same reason. We would be glad to share with you numerous standard corrosion control and treatment reference works, best practices guides and published results from US and international lead corrosion control field and pilot studies. Secondly, the basis for that target (other communities using Lake Huron source use the same dose) is not scientifically derived nor does it consider water quality and the current state of Flint's distribution system. We have reviewed the original Detroit corrosion study and have seen some of the LCR monitoring data, and besides the fact that it did not directly pertain to this water source, few dosages were tested in the cited 1994 pipe loop study, and the higher dosage than the one implemented in the field currently was more effective. Based on the limited amount of data on the quality of Detroit water, what we know about the history of Detroit corrosion control, we think an orthophosphate residual of 3 to 4 mg PO4/L should be the minimum starting test target residual for pipe passivation. It is likely that, at least initially a higher dosage will be necessary to reach the far ends of the distribution system and sufficiently reduce lead solubility and release from all lead sources. To allow flexibility, we feel the design of the chemical feed and storage systems should be able to consistently deliver a maximum dose of 5 to 6 mg PO4/L, if substantial orthophosphate loss is observed, if the starting dose is set for the desired residual level of 3 to 4 mg/L as PO4. We suggest that jar tests be performed in advance of orthophosphate addition to Detroit water to evaluate the impact of orthophosphate dose on turbidity that could result from interactions between orthophosphate and background Detroit water quality parameters (e.g., aluminum, calcium, etc.).

We want to stress that immediately shifting to Detroit water and adding orthophosphate will not necessarily translate to immediate improvements. Furthermore, this is a change, albeit a return to past conditions. Nonetheless, a period of system upset should be anticipated. The need for a communication strategy and a distribution system plan are critical.

Lastly, we see no mention of a water quality monitoring program. Two programs need to be put in place immediately (before return to Detroit water) to 1) identify lead sources, 2) assess treatment effectiveness against lead release from all of the simultaneously operating mechanisms (solubility, particulate release, galvanic corrosion), and 3) assess orthophosphate levels and stability of water quality in the distribution system.

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materials, lengths, sizes, and location and type of inline devices and faucets using profile sampling. For confidence in interpretation, probably at least 5 sites from each of the configurations will be necessary. The configurations we would estimate to be most important (but should be changed or added to if local construction practice indicates it's necessary): Lead service line, galvanized steel interior plumbing; lead service line, copper with leaded solder joints; lead service line, plastic interior plumbing. It is also possible that interior plumbing may differ from the material used for the customer-side service line segment. We would be glad to discuss the specifics of this sampling effort.
For the purpose of assessing stability of water quality in the distribution system and to inform on orthophosphate residual adjustment, we suggest that 8 to 10 locations in the distribution system be selected to measure pH, alkalinity, orthophosphate, turbidity and iron on a weekly basis. These could be collected from TCR sampling locations, or other readily-accessible buildings, should be located at a distribution of locations in the distribution system and should be collected after a flush sufficiently long to assure that "fresh" distribution system water is being measured. Research has shown that over time, orthophosphate can reduce disinfectant demand associated with corroding metallic distribution system materials. These measurements need to be performed in the field and can simply be done with a portable HACH test kit or spectrophotometer.

A lead sampling plan needs to be in place to access the effectiveness of water change and treatment boost. LCR monitoring sites with confirmed lead service lines can be in the sampling pool. Sampling should consist of a 1 liter first draw sample (LCR sample without 5 minute pre-flush), followed by an additional flushed sample or two depending on profile sample results which is intended to capture major lead source(s). The specific details of this effort need to be worked out by the technical committee as soon as possible. We would gladly work with Flint on establishing a water sampling program to identity and verify lead service line sites. The plan and initial sampling effort should be performed before the switch so that one baseline sample set is collected.

Lastly, our strength does not fall under full-scale pump and chemical feed delivery systems. We would only say that the systems need to be scaled-up in size to accommodate our suggested dosing needs. Also, there is the some discussion about diverting water to the Dort reservoir and an associated orthophosphate feed system. We are not familiar with the reservoir but are wondering if it is an open reservoir?

Of course this is a lot of information to share and we would gladly be available to discuss the technical and scientific basis for our suggestions.
Let us know if you have any questions and thanks again,

Darren and Mike

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Fax: (513) 487-2543
email: lytle.darren@epa.gov

From: Prysby, Mike (DEQ) [mailto:PRYSBYM@michigan.gov]
Sent: Friday, October 16, 2015 1:32 PM
To: Lytle, Darren <Lytle.Darren@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>
Cc: Busch, Stephen (DEQ) <BUSCHS@michigan.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Darren, Michael

We have received Flint's corrosion control proposal from their consultant. If you have comments, please provide them to me by Monday morning.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

From: Matta, Samir [mailto:SFMatta@lan-inc.com]
Sent: Friday, October 16, 2015 12:02 AM
To: Prysby, Mike (DEQ)
Subject: Flint WTP PH2 SEG4 - Corrosion Control

Hi Mike,

Please see attached plans for the Corrosion Control Plan for the City of Flint. I will have the official submittal package to you tomorrow afternoon after I get Brent or Mike's signature on the permit application. I will call you when I get back in Lansing to drop the package. Is three sets of full size plans adequate? Would you like some half size plans? Let me know.

Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4. Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that, at least initially, there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.
The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Please let me know if the information is adequate or you require additional information.

Thanks.

Samir F. Matta, PE
Team Leader

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2121 University Park Dr, Suite 100 • Okemos, MI 48864-6901
D 517.819.2367 **C** 517.819.2367
www.lan-inc.com • sfmatta@lan-inc.com

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, October 23, 2015 3:23 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Jim –

We are very close. I checked with the Task Force on the plan you sent to us incorporating EPA's comments. See annotations below. There are several changes (in red italics) that EPA feels need to be incorporated into the text to reflect our earlier comments (from Mike and Darren) and the subsequent call. Additionally, there is a recommendation at the end that was discussed but not incorporated into the writeup you sent which we also feel should be incorporated.

Please feel free to get back with me if you have any questions. We appreciate the opportunity to provide input and your willingness to address our comments.

- Bob

This will summarize our phone conversation of 10/19 and provide clarification regarding the previous comments.

The City of Flint converted back to purchasing of Detroit Water and Sewerage Department water on Friday October 16, 2015. No indications of upset in the distribution system have been reported to date.

Detroit Water and Sewerage Department (DWSD) has confirmed the use of Innophos "Phosphoric Acid 75% Technical" product which is NSF Standard 60 certified with a maximum allowable feed rate of 13 mg/L as product.

The City of Flint will need to supply a similar phosphoric acid product, NSF Standard 60 approved with allowable maximum dosage.

DWSD supplied water is currently dosed at 0.39 mg/L as P (1.2 mg/L as PO4) slightly above DWSD's OCCT requirement to dose a minimum of 0.9 mg/L as PO4 and have a minimum plant tap residual of 0.8 mg/L as PO4. DWSD plant tap residuals have been shown to consistently be at 0.39 mg/L as P (1.2 mg/L as PO4). In addition water supply entering Flint has been tested and so far shown to contain approximately 0.39 mg/L as P (1.2 mg/L as PO4) as well. *Flint will need to test to ensure that pH is not significantly affected at the PO4 target dosage.*

To achieve pipe passivation Flint will boost orthophosphate dosage to establish a minimum distribution residual of 1.0 mg/L as P (3.1 mg/L as PO4). The chemical feed system will be sized to achieve a dose up to 2.0 mg/L as P (6.1 mg/L as PO4) in case orthophosphate loss is observed.

Flint will continue Water Quality Parameter Monitoring in accordance with the LCR at the same 25 distribution locations used under the Flint River. In addition 10 of these locations also serve as total coliform monitoring sites, including disinfectant residual, and Flint will be told to, for the purpose of assessing water stability, conduct water quality parameter monitoring *for pH, alkalinity, orthophosphate*, along with turbidity and iron sampling will be at these 10 locations on a weekly basis as suggested. This will also ensure that a minimum recommended pH levels are being maintained throughout the system.

EPA ORD staff will provide instructions to the City of Flint for creating test loops to help confirm effectiveness of the corrosion control treatment. This data will help in rebuilding public trust.

The County Health Department and MI Department of Health and Human Services will be conducting blood lead level testing of children in Flint. Children with elevated blood lead levels will be offered exposure assessments of their homes. These assessments should include the contribution of lead from service line and interior plumbing sources. Such diagnostic testing should help further substantiate the effectiveness of corrosion control treatment. Procedures recommended by EPA should be shared with the Michigan Department of Health and Human Services.

The University of Michigan in Ann Arbor had previously expressed interest in assisting the City of Flint. Both the Department of Civil and Environmental Engineering, and School of Public Health should be contacted to determine if that interest still exists with potential to assist in both test loop construction and monitoring, and exposure assessment monitoring in homes. Any water analysis should occur at a certified laboratory.

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The City of Flint is continuing to digitize service line index card records into a Geographic Information System to confirm the location of lead service lines. EPA can provide additional information to the City regarding a sampling procedure to verify lead service line sites.

The City's engineering consultant will need to evaluate KWA water in conjunction with the City of Flint treatment plant processes to determine any necessary adjustments in optimized corrosion control treatment prior to initiating service to customers. Full scale testing may not be feasible.

Lastly, we discussed additional lead drinking water monitoring Flint should do to better assess lead exposure, determine effectiveness of water source change and corrosion control, and identify lead sources. That discussion does not appear to be captured here.

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Friday, October 23, 2015 11:39 AM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Sounds Good.
Met with the Mayor today and he seems to be under the impression that the City Administrator is on this task force as well. I told him I would check but this was intended to make sure that the state and EPA are taking consistent technical positions. Let me know if I'm wrong about that.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, October 23, 2015 10:37 AM
To: Sygo, Jim (DEQ)
Subject: RE: Flint WTP PH2 SEG4 - Corrosion Control

Jim,

Thanks for the note. There does appear to be agreement. I will confirm that with the Task Force team members today just to make certain we haven't missed anything.

This is good news. I'm glad we're moving quickly, and working together. The Task Force will discuss the "test loops" and make sure we have agreement on the protocol.

I'm setting up a call for next week to discuss this weekend's school sampling effort.

- Bob

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From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Thursday, October 22, 2015 4:39 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: FW: Flint WTP PH2 SEG4 - Corrosion Control

Bob,
There appears to be agreement on the optimization of corrosion control for the City of Flint. This is the note provided to me by staff after a discussion with members of your task force.

From: Busch, Stephen (DEQ)
Sent: Thursday, October 22, 2015 12:58 PM
To: Schock, Michael; Lytle, Darren
Cc: Kempic, Jeffrey; Prysby, Mike (DEQ); kaplan.robert@epa.gov; Krisztian, George (DEQ); Sygo, Jim (DEQ)
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Darren and Mike

Darren A. Lytle, Ph.D., P.E.

Branch Chief (Acting)
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Cincinnati, Ohio 45268
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Sent: Friday, October 16, 2015 1:32 PM
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Thanks.

Samir F. Matta, PE
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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Saturday, October 24, 2015 1:59 PM
To: Kaplan, Robert
Subject: Re: One further comment

DEQ and HSH will be ramping up educational information.
What EPA report is being referred to?
This should be discussed with the City Administrator. DEQ does not own the
The distribution lines and would not be digging them up to assess what appears to be a research project. Will discuss further with our team to see how this might be addressed.
Talk to you later this week.
Sent from my iPhone

On Oct 24, 2015, at 8:58 AM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:

> Jim, I'm sorry that we have a straggler. This morning I received one last comment. I ordinary would say "too late" but this comment reflects deep knowledge of the Flint system (esp. the residence at issue). Pls let me know if there are any issues. Again, sorry for the late and unconsolidated comment.
>
> Bob
>
> 1) Has anyone evaluated where the water quality parameter monitoring is being conducted by Flint? If not, we might want to do that to make sure that the sites selected are representattive of the water quality throughout the city. My concern is that the chlorine residual range reported by the City in their October 2015 water quality report is given as 0.2 – 4.0(https://www.cityofflint.com/public-works/utilitieswater/water-treatment-plant/).However, we know that in at least one area of the city, even after flushing the tap for 8 hours, there was no detectable chlorine residudal. Repeated tests over 18 days (last one was September 3) show the same. These measurements were done after the replacement of the old service line, so the chlorine is not getting to this area (http://flintwaterstudy.org/information-for-flint-residents/chlorine-monitoring-in-flint-resident-ms-leeanne-walters-home/)
>
> 2) The recommendations in the final report on the sampling we did in Flint are linked to the corrosion control treatment. The lead concentrations in the scale/sediment are orders of magnitude higher that what we typically see in drinking water samples, so I think from a risk perspective, we need to better understand the composition and stability of the scales withn the pipes to to assess the stability of the scales and inform the treatment. Although the release of scale/sediment is not unique to Flint, the dislodging of scale/sediment would pose the greatest risk to residents by far. Our final report will be posted in the near future so should we include the assessment sampling in our comments on corrosion control (see below)?
>
> Recommendations

As indicated by the results from the Citizen Name / Ex. 6 home and previous EPA work, the presence of lead pipes over many years has likely resulted in the accumulation of lead in the scales within non-lead pipes downstream of the lead pipe and physical disturbances to the leaded or non-leaded portions of the service lines have the potential to release large amounts of scale and sediment that could pose an immediate and acute health hazard to the residents. Consequently, even with corrosion control treatment in place in the future, physical disturbances will be capable of dislodging the high lead-bearing scale and sediment from non-lead pipes as well as lead pipes, as was the case in the earlier EPA study.

Obtaining information on the lead reservoirs in the scales within the lead and non-leaded portions of intact service lines is essential for determining the potential risk to residents from lead-bearing scale released as lead lines are replaced as well as the risk that may remain following removal of the lead lines, where the non-leaded portions of service lines are left in place.

As the Citizen Name / Ex. 6 service line was very long compared to the length of most typical service lines, it is important to assess the potential risk posed by the scale reservoirs in more typical lengths of service lines by extracting both the leaded and non-leaded portions of service lines which have not been physically disturbed. The service lines chosen for extraction and analysis should be representative of the materials commonly used downstream of the lead pipe (e.g., galvanized iron, copper, plastic). Extraction/handling procedures should be developed by EPA to ensure that damage to the scales from the excavation, extraction and delivery of the service line segments is minimized. Sequential sampling should also be conducted on a representative group of homes with common plumbing materials (e.g., galvanized iron, copper, plastic) to determine the extent to which the lead from the service line has seeded the interior plumbing in homes.

It is also critically important to develop and incorporate ongoing training and public education on the potential for high lead release from the scales as a result of any future physical disturbances to service lines and mitigative actions that residents can take to lower their exposure risk. The training and educational material should be assessed for clarity, meaningfulness, and accessibility by a group of residents and health experts to ensure the effectiveness of the communications.

At a minimum, immediate training and public education on the potential risks posed by physical disturbances to service lines should be developed by communications experts and provided to residents, community groups, elected officials, health departments, pediatricians and gynecologists, water and non-water utilities (gas, electric, cable, etc.), plumbing organizations and contractors. Residents should be notified of scheduled work by water and non-water utilities and informed of the potential risk of increased lead levels due to these disturbances.

Sent from my iPhone

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, October 28, 2015 2:03 PM
To: Kaplan, Robert; shekterl@michigan.gov; Krisztian, George (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Shaler, Karen (DEQ); Henry, Timothy; Deltoral, Miguel; Poy, Thomas; Schock, Michael; Kempic, Jeffrey; Lytle, Darren
Cc: Shaler, Karen (DEQ)
Subject: RE: After Action - Flint Task Force Discussion of School Sampling Event - Please call Conference Code / Ex.6

Pursuant to our meeting today, you requested contact information regarding the modeling that was done for lead exposure by Michigan's Department of Human Health and Services. Below pease find the contact information for Linda Dykema and Eden Wells. I would start with Linda Dykema, with any questions that you have.

Linda D. Dykema, Ph.D.
Environmental Public Health Director
Division of Environmental Health
Michigan Department of Health & Human Services
517.335.8566
dykemal@michigan.gov

Eden V. Wells, MD, MPH, FACPM
Chief Medical Executive
Michigan Department of Health and Human Services
201 Townsend Street, 5th Floor CVB
Lansing, MI 48913
Phone: 517-335-8011
wellse3@michigan.gov

-----Original Appointment-----
From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, October 23, 2015 1:58 PM
To: Kaplan, Robert; Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ); Krisztian, George (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Shaler, Karen (DEQ); Henry, Timothy; Deltoral, Miguel; Poy, Thomas; Schock, Michael; Kempic, Jeffrey; Lytle, Darren
Cc: Cook, Pat (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: After Action - Flint Task Force Discussion of School Sampling Event - Please call Conference Code / Ex.6 Conference Code / Ex.6
When: Wednesday, October 28, 2015 1:30 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Region 5 - Robert Kaplan's Office

Forwarding this meeting notice to place it on your calendars as Jim Sygo would like you to participate with him. Jim also wanted Pat Cook to participate, but he's unavailable. I've reserved the Great Lakes Conference Room for this call. Thanks.

Karen Shaler

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Conference Code / Ex.6
When: Wednesday, October 28, 2015 12:30 PM-1:30 PM (UTC-06:00) Central Time (US & Canada).
Where: Region 5 - Robert Kaplan's Office

Attendees:

Robert Kaplan
Timothy Henry
Miguel Deltoral
Thomas Poy
Michael Schock
Jeffrey Kempic
Darren Lytle
Jim Sygo
George Krisztian
Liane Shekter Smith
Steve Busch
Mike Prysby

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, October 28, 2015 3:00 PM
To: Henry, Timothy
Cc: Kaplan, Robert
Subject: RE: After Action - Flint Task Force Discussion of School Sampling Event - Please call Conference Code / Ex.6

They are not. We expect to finish their permit today and the cover letter tomorrow so they can start construction of the additional feed later this week.

From: Henry, Timothy [mailto:henry.timothy@epa.gov]
Sent: Wednesday, October 28, 2015 3:47 PM
To: Sygo, Jim (DEQ)
Cc: Kaplan, Robert
Subject: RE: After Action - Flint Task Force Discussion of School Sampling Event - Please call Conference Code / Ex.6 Conference Code / Ex.6

Thanks Jim. Can you confirm whether at this point in time Flint is providing any orthophosphate addition for corrosion control beyond what is in the incoming water from the Great Lakes Water Authority (Detroit). The question came up in a recent call and we did not have a definitive answer.

Tim Henry
Deputy Director, Water Division
U.S. EPA (W-15J)
77 W. Jackson Blvd., Chicago, IL 60604-3590
Phone: 312.886.6107 Fax: 312.692.2578

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Wednesday, October 28, 2015 2:03 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>; shekterl@michigan.gov; Krisztian, George (DEQ) <krisztiang@michigan.gov>; Busch, Stephen (DEQ) <BUSCHS@michigan.gov>; Prysby, Mike (DEQ) <PRYSBYM@michigan.gov>; Shaler, Karen (DEQ) <SHALERK@michigan.gov>; Henry, Timothy <henry.timothy@epa.gov>; Deltoral, Miguel <deltoral.miguel@epa.gov>; Poy, Thomas <poy.thomas@epa.gov>; Schock, Michael <Schock.Michael@epa.gov>; Kempic, Jeffrey <Kempic.Jeffrey@epa.gov>; Lytle, Darren <Lytle.Darren@epa.gov>
Cc: Shaler, Karen (DEQ) <SHALERK@michigan.gov>
Subject: RE: After Action - Flint Task Force Discussion of School Sampling Event - Please call Conference Code / Ex.6 Conference Code / Ex.6

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Linda D. Dykema, Ph.D.
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Attendees:

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Timothy Henry
Miguel Deltoral
Thomas Poy
Michael Schock
Jeffrey Kempic
Darren Lytle
Jim Sygo
George Krisztian

Liane Shekter Smith
Steve Busch
Mike Prysby

Kaplan, Robert

From: Kaplan, Robert
Sent: Thursday, October 29, 2015 2:49 PM
To: 'Sygo, Jim (DEQ)'
Subject: letter and permit

Hi Jim,

When you get a chance, pls send me the permit (and letter, if ready).

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Thursday, October 29, 2015 2:53 PM
To: Kaplan, Robert
Subject: Fwd: Act 399 Permit
Attachments: PO4 Permit.pdf; ATT00001.htm

Bob,
Here is the permit that went out to Flint yesterday.

Will get you the letter tomorrow.

Sent from my iPhone

Begin forwarded message:

> **From:** "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>
> **Date:** October 29, 2015 at 2:26:06 PM EDT
> **To:** "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
> **Cc:** "Krisztian, George (DEQ)" <krisztiang@michigan.gov>
> **Subject: Act 399 Permit**
>
> Jim,
>
> Attached is the DEQ Act 399 construction permit authorizing the city to install the phosphate feed system for corrosion control. We are currently drafting the corrosion control plan letter for the city and a copy of the final letter will be provided.
>
> Michael Prysby, P.E.
> District Engineer
> Office of Drinking Water and Municipal Assistance
> 517 290-8817

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

(CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN

Required under the Authority of 1976 PA 399, as amended

ENTERED

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. **Municipality or Organization, Address and WSSN** that will own or control the water facilities to be constructed. This permit is to be issued to: City of Flint 4500 N. Dort Highway Flint, MI 48505 **WSSN**: 02310	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 5 1 1 0 4 OCT 2 8 2015 EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. **Owner's Contact Person** (provide name for questions): Contact: Brent Wright Title: Water Plant Supervisor Phone: 810.787.6537		
3. **Project Name** (Provide phase number if project is segmented): Flint WTP Phase II, Segment 4 Corrosion Control	4. **Project Location** (City, Village, Township): Flint, MI	5. **County** (location of project): Genesee

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENT QUALITY

cc: DEQ RESOURCE MANAGEMENT DIVISION OCT 16 2015 LANSING DISTRICT

Issued by: Michael Prysby

Reviewed by: Michael Prysby

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

a. This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
b. The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
c. This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
d. Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
e. Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
f. All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
g. All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
h. Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
i. Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW. Use additional sheets if needed.

The project entails installation of phosphate feed systems at both Control Station #2 (CS#2) and Pump Station #4 (PS#4). Feed at CS#2 will provide the ability to add phosphate for corrosion control to finished water supplied from the Detroit Water & Sewer Department (DWSD). Feed at PS#4 will provide the ability to add phophate to finished water to supply from either the Flint River or Lake Huron via the Karegondi Water Authority (KWA). Both feed systems are temporary systems until the planned filter transfer pump station is constructed. A permanent phosphate feed system will be constructed as part of that contract.

The feed rate will be proportionally controlled based on the water flow rate and will be tied to the existing SCADA system. See attached basis of design for more detailed information.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES	
Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. **OR** 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:

Jeremy Nakashima, PE
Lockwood, Andrews and Newnam, Inc.
1311 South Linden Rd, Suite B
Flint, MI 48532
jnnakashima@lan-inc.com

8. Indicate who will provide project construction inspection:
☐ Organization listed in Box 1.
☒ Engineering firm listed in Box 7.
☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?
☒ YES ☐ NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?
☒ YES ☐ NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?
☒ YES ☐ NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?
☒ YES ☐ NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?
☒ YES ☐ NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.)
☒ YES ☐ NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?
☐ YES ☒ NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?
☐ YES ☒ NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?
☐ YES ☒ NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐YES ☒NO
If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?
☐YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☒NO: Describe why activity is not regulated:
Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?
☐YES ☒NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?
☐YES ☐NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, BRENT F WEIGHT (print) (name), acting as the PLANT SUPERVISOR (print) (title/position) for

CITY OF FLINT WATER PLANT (print) (entity owning proposed facilities) certify that this project has been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Signature* 10-16-2015 Date (810) 787-4537 Phone

*Original signature only, no photocopies will be accepted.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: Flint WTP Phase II, Segment 4 Corrosion Control

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

A. A general map of the initial and ultimate service areas
☒ Included on engineering plans ☐ Attached separately

B. Number of service connections served by this permit application all customers

C. Total number of service connections ultimately served by entire project all customers

D. Residential Equivalent Units (REUs) served by this permit application _____

E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____

F. Water flow rates for proposed project based on REUs listed in "D' and "E" above

1. Initial design average day flow (mgd) 18.3
2. Initial design maximum day flow (mgd) 25.4
3. Total design average day flow (mgd) 24.0
4. Total design maximum day flow (mgd) 36.0
5. Required fire flows: (1) _____ gpm for _____ hours

G. Actual flows and pressures of existing system at the connection point(s) (2)
_____ gpm at _____ psi
_____ gpm at _____ psi
_____ gpm at _____ psi
_____ gpm at _____ psi

H. Estimated minimum flows and pressures within the proposed water main system (3) _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

City of Flint
Phase II, Segment 4 Corrosion Control
Basis of Design

Given that Flint will require lead and copper corrosion control and given that Detroit utilizes orthophosphate for their corrosion control methodology, and that Flint will be receiving Detroit water for the immediate future, orthophosphate is the appropriate corrosion control methodology for Flint. A dosage of 0.8 mg/l as PO_4 has been recommended for the Detroit water. Numerous utilities utilizing Lake Michigan water have a target dosage of 0.9 mg/l as PO_4. Therefore, a target dosage in the range of 0.8 to 0.9 mg/l appears appropriate.

It is expected that initially there will be a significant PO_4 demand in the system. This will require a significantly higher dosage until this demand is satisfied and the target residual can be maintained. We are therefore designing for capability of a maximum dosage of 1.5 mg/l.

The arriving Detroit water will likely have some residual PO_4 when it arrives at Flint. It has been reported that this residual will be approximately 0.4 mg/l. The system must therefore be capable of a minimum dosage of 0.4 mg/l.

Based upon the usage of 75% Phosphoric Acid and a flow range of 4 MGD to 25 MGD, with an average day of 16 MGD, the expected feed rate will be 1.35 to 32 gpd. Average Phosphoric Acid feed is expected to be 10.8 gpd, requiring 30 days storage of 325 gal. Phosphoric acid will be stored in delivered totes and will be placed with containment pallets for dual containment.

Orthophosphate will need to be applied at two locations. Detroit water will enter the Flint system at Control Station CS2, and supplementary phosphate will be applied there. However, on occasion some incoming water may need to be diverted to the Dort Reservoir, bypassing CS2. This water would then be introduced to the system through High Service Pump Station PS4 and phosphate would be introduced at this location.

Lockwood, Andrews & Newnam, Inc.

PLANNING

ENGINEERING

PROGRAM MANAGEMENT

Est. 1935

AUSTIN, TX
CHICAGO, IL
CLEARWATER, FL
COLLEGE STATION, TX
DALLAS, TX
FLINT, MI
FORT WORTH, TX
HOUSTON, TX
HUNTINGTON BEACH, CA
LAS VEGAS, NV
LOS ANGELES, CA
MIAMI, FL
MILPITAS, CA
PHOENIX, AZ
SACRAMENTO, CA
SAN ANTONIO, TX
SAN MARCOS, TX
WACO, TX

TRANSMITTAL

Filing Data Code 1-07

☐ UPS ☐ FEDEX ☐ DELIVERY SERVICE ☐ HAND DELIVER ☐ OVERNIGHT ☐ REGULAR MAIL ☐ PICK-UP ☒ OTHER Extranet(To PM)

To: Michael Prysby	**Date** 10-16-13
	Project Number 130-10701-001
Company: MDEQ	**Routing:**
Address: 525 WEST ALLEGAN STREET Lansing, MI 48933	
Project: City of Flint Water Treatment Plant Improvements.	

We Are Sending You:		These Are Transmitted:
☐ Shop Drawings	☐ Reports	☐ As Requested
☐ Original Drawings	☐ Submittal Data	☒ For Your Use
☒ Prints	☐ Proposal	☒ For Review and Comment
☐ Specifications	☐ As Noted	☐ For Your Signature

Quantity	Description
3	Full Set of Plans for Ph2-Seg4 Corrosion Control
1	Act 399 Permit Application
1	11x17 Set of Plan for Ph2-Seg4 Corrosion Control

Remarks

These plans have been modified slightly from the set electronically submitted last night.

We look forward to your comments and approval.

Thanks.

DEQ
RESOURCE MANAGEMENT DIVISION
OCT 16 2015
LANSING DISTRICT

Distribution	Prepared By
1- Mike Glasgow 2- Brent Wright 3- File	Samir Matta, PE

1311 SOUTH LINDEN ROAD
SUITE B
FLINT, MI 48532
TEL 810.820.2682
FAX 810.820.2703
www.lan-inc.com

If enclosures are not as noted, kindly notify us at once.

Kaplan, Robert

From: Kaplan, Robert
Sent: Thursday, October 29, 2015 3:05 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Act 399 Permit

Perfect. Thanks, Jim.

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Thursday, October 29, 2015 2:53 PM
> **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> **Subject:** Fwd: Act 399 Permit
>
> Bob,
> Here is the permit that went out to Flint yesterday.
>
> Will get you the letter tomorrow.
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>
> > **Date:** October 29, 2015 at 2:26:06 PM EDT
> > **To:** "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
> > **Cc:** "Krisztian, George (DEQ)" <krisztiang@michigan.gov>
> > **Subject: Act 399 Permit**
> >
> > Jim,
> >
> > Attached is the DEQ Act 399 construction permit authorizing the city to install the phosphate feed system for corrosion control. We are currently drafting the corrosion control plan letter for the city and a copy of the final letter will be provided.
> >
> > Michael Prysby, P.E.
> > District Engineer
> > Office of Drinking Water and Municipal Assistance
> > 517 290-8817

Kaplan, Robert

From: Kaplan, Robert
Sent: Thursday, October 29, 2015 4:04 PM
To: 'Sygo, Jim (DEQ)'
Subject: Please call me. Thanks.

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 30, 2015 8:10 AM
To: Kaplan, Robert
Subject: RE: We need to discuss today

The permit is for construction at the plant. My understanding is the letter becomes part of their operation plan. Will try to touch base with you later today Some of us are in Flint today for a meeting with the City administrator.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, October 30, 2015 8:58 AM
To: Sygo, Jim (DEQ)
Subject: We need to discuss today

Jim,

In the interests of time, I am sending over a comment from TF discussions directly. There are a few technical concerns about the permit issued to Flint. Could you consider the comment below and let me know your thoughts? It's important to all that we get this nailed down without delaying the feeding of corrosion control. Thanks.

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I'm thinking some water samples should be taken for alkalinity and orthophosphate (or total P, given it's a phosphoric acid product, for convenience of analysis and preservation) and have your R5 laboratory analyze them, so that we can be sure of the phosphate and alkalinity levels.

Sent from my iPhone

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 30, 2015 10:10 AM
To: Kaplan, Robert
Subject: RE: We need to discuss today Deliberative
Attachments: Draft Flint CCT operation letter.docx

Bob,
Attached is a draft of the letter we will be sending today. I believe it addresses this items identified.
Michigan utilizes the Application form submitted by the applicant as the template for the construction permit That's why your staff were confused becfause that was part of the application.
The operation letter is enforceable by regulation in Michigan.

Please review the draft quickly. If it needs any changes please get them to me by 3:00pm. We will be sending it out at 4:00pm today

Do not release this document until signed and sent to the City of Flint

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Sent from my iPhone

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

October 30, 2015

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as PO_4, and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as PO_4. As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as PO_4 (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

As part of the City water system operations, the City shall conduct:

- **Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as PO_4**
- **Daily monitoring of additional orthophosphate dosage, as PO_4**
- **Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as PO_4**

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

Enhanced Water Quality Parameter Monitoring

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as $CaCO_3$), Calcium (mg/L as Ca^{2+}), and orthophosphate (mg/L PO_4). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

- **Turbidity (NTU)**
- **Iron (mg/L)**
- **Orthophosphate (mg/L PO_4)**
- **pH**
- **Total Alkalinity (mg/L as $CaCO_3$)**
- **Calcium (mg/L as Ca^{2+})**
- **Chloride (mg/L as Cl^-)**
- **Temperature (Celcius)**
- **Conductivity (mS)**

If orthophosphate residual levels less than 3.1 mg/L as PO_4 (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as PO_4 (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

Corrosion Control Treatment Test Loops

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or lytle.darren@epa.gov.

Lead Service Line Verification Sampling

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for lead and copper is expected to be completed by a certified lab.

Customer Household Exposure Assessment

The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at

their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis for lead and copper is expected to be completed by a certified lab. It is recommended that any additional research monitoring should be further evaluated by the City's Technical Advisory Committee prior to being conducted.

Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,

Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance
517-290-8817

cc: Mr. Brent Wright, City of Flint
Mr. Howard Croft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Darren Lytle, U.S. EPA
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.
Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, October 30, 2015 12:39 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: We need to discuss today Deliberative

Received, thanks. We will turn this around as quickly as we can. --Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Friday, October 30, 2015 10:10 AM
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Sent from my iPhone

Kaplan, Robert

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Sent: Friday, October 30, 2015 2:37 PM
To: 'Sygo, Jim (DEQ)'
Subject: Jim, could you give me a call? We will have comments in about 15 mins.

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 30, 2015 2:57 PM
To: Kaplan, Robert
Subject: FW: We need to discuss today
Attachments: PO4 Permit (revised dosage).pdf

We will take care of this issue with an amendment to the permit.

From: Prysby, Mike (DEQ)
Sent: Friday, October 30, 2015 2:35 PM
To: Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: RE: We need to discuss today

Jim,

Attached is the revised PO4 dosage that LAN sent us last Tuesday. The revised dosage sheet was included in the permit. The Act 399 Permit application; however, included the original PO4 dosage on the BOD page that was proposed prior to EPA's comments and should have been omitted (my over-sight). We can discuss this later today. The revised dosage should address EPA's concern.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

Flint Phosphate Calculations

Chemical will be 75% NSF certified Phosphoric acid

75% acid has a density of 13.17 #/gal. (5,974 g/gal) 13.17×453.5923

Of this 75% is Phosphoric acid (H_3PO_4) = 4,480 g H_3PO_4/gal 5,974 × 0.75

Molecular weight of H_3PO_4 is 97.9913 g/mole

Moles H_3PO_4 / gal = 45.72 4,480/97.9913

Moles H_3PO_4 = Moles Orthophosphate (PO_4^{-3}) = Moles Phosphorus (P)

Species	Molecular Wt.	Moles / gal	g/gal
H_3PO_4	97.9913	45.72	4,480
PO_4^{-3}	94.9676	45.72	4341.92
P	30.97	45.72	1407.72

Proposed Operating Parameters

Assumptions per DEQ:

- City of Detroit residual is 0.39 mg/l as P
- MDEQ wants Flint to maintain a residual of approximately 1.0 mg/l as P
- Feed pump capacity should be sized for a max dose of 2.0 mg/l as P

	Plant Flow	Dosage as PO_4^{-3}*	Dosage as P
Maximum	25 MGD	6.13 mg/l	2.0 mg/l
Average	16 MGD	3.07 mg/l	1.0 mg/l
Minimum	8 MGD	1.53 mg/	0.5 mg/l

*Equivalent dosage to P dosage

Feed Rate Calculations

Maximum feed rate (Max Flow × Max Dosage)

25 MGD × 3782 g/gal H_2O × 2.0 ppm / 1,408 g/gal = 134.30 gpd Phosphoric Acid

Average feed rate (Avg Flow × Avg Dosage)

16 MGD × 3782 g/gal H_2O × (1.0 ppm – 0.39 ppm) / 1,408 g/gal = 26.21 gpd Phosphoric Acid

Minimum feed rate (Min Flow × Min Dosage)

8 MGD × 3782 g/gal H_2O × (1.0 ppm – 0.39 ppm) / 1,408 g/gal = 13.10 gpd Phosphoric Acid

Storage Requirements

30 days supply at average flow and dosage = 26.21 gpd × 30 days = 786 gal.

Assuming the use of 275 gal semi-bulk totes, 3 totes required (recommend 2 in service, 1 spare)

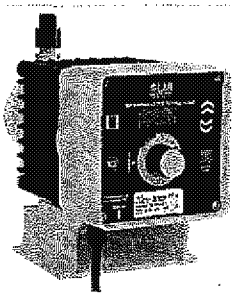
Four Function Valve
AUTOPRIME™ liquid End
High Viscosity Liquid End
Low Level Float Switch
Digi-Pulse Flow Monitor
Repair & Preventive Maintenance Kits
Calibration Columns

LMI®
an Accudyne Industries brand

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps

Series C Chemical Metering Pumps have been an industry standard for over 20 years. Designed for Municipal/ Industrial applications, the familiar yellow and black pumps have a rugged, totally enclosed, chemically resistant housing for protection in the harshest environments. Encapsulated electronics and a rigid housing and stroke bracket ensure years of precise, repeatable performance.



High Resolution Image

Request a Quote

Features Tab **Information Tab** **Options Tab**

Adjustable stroke frequency and the flexibility of up to 1000:1 turndown ratio

Manually adjustable stroke length provides accurate pump output adjustment

NEMA 4X / IP65 enclosures for protection against corrosive environments

Time tested electronics for reliable, repeatable performance

Totally encapsulated electronics for protection against moisture and corrosive conditions

Inputs for low level switch available on certain models

Models with external pacing for flow proportional applications

Advanced control options for simplified system integration (pulse multiply/divide, 4-20 mA, remote on/off)

*UL, *CUL, NSF 50, NSF 61, *CE Certifications

Control Codes:
1 – Dual Manual Control (speed and stroke length)
7 – Pulse Input / Dual Manual Control
9 – Pulse/Analog Input / Dual Manual Control

Output Codes with standard liquid end	
Max Capacity:	**Max Pressure:**
*CX0 – 1.3 GPH (4.9 l/h)	300 psi (20.7 Bar)
*CX1 – 2.5 GPH (9.5 l/h)	150 psi (10.3 Bar)
*CX2 – 4.0 GPH (15.1 l/h)	100 psi (6.9 Bar)
*CX3 – 8.0 GPH (30.3 l/h)	60 psi (4.1 Bar)
*CX4 – 20 GPH (75.7 l/h)	25 psi (1.7 Bar)
C76 – 4.0 GPH (15.1 l/h)	175 psi (12.1 Bar)
C77 – 10.0 GPH (38.0 l/h)	80 psi (5.5 Bar)
C78 – 25 GPH (95.0 l/h)	30 psi (2.07 Bar)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO. W 151104 OCT 28 2015

EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 30, 2015 2:58 PM
To: Kaplan, Robert
Subject: RE: Jim, could you give me a call? We will have comments in about 15 mins.

Will do

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Robert Kaplan
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Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, October 30, 2015 3:26 PM
To: 'Sygo, Jim (DEQ)'
Subject: EPA Task Force comments on letter sending Flint Corrosion Control Permit
Attachments: Draft Flint CCT operation letter tpedits.docx

Jim,

On behalf of the Task Force, thank you for sending us the corrosion control plan letter this morning for our review. Attached please find EPA's edits to that letter. We also understand that MDEQ will issue an amended permit shortly to take account of the Task Force's comments sent to you today.

EPA encourages the City to take advantage of our offer for analytical support as our laboratory can analyze for a more robust set of parameters. The presence or absence of these additional parameters has provided valuable information and insights in past efforts on identifying potential sources of lead.

The Task Force believes Flint should implement the additional corrosion control treatment as soon as possible. The letter and amended permit are an important step in making sure additional corrosion control takes place quickly and appropriately.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
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RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

DAN WYANT
DIRECTOR

October 30, 2015

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
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Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as PO_4 (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

As part of the City water system operations, the City shall conduct:

- **Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as PO_4**
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- **Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as PO_4**

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

Enhanced Water Quality Parameter Monitoring

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as $CaCO_3$), Calcium (mg/L as Ca^{2+}), and orthophosphate (mg/L PO_4). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

Commented [PT1]: In addition to the 10 locations, the entry point to the distribution system should be one of the locations for enhanced WQP monitoring.

- **Turbidity (NTU)**
- **Iron (mg/L)**
- **Orthophosphate (mg/L PO_4)**
- **pH**
- **Total Alkalinity (mg/L as $CaCO_3$)**
- **Calcium (mg/L as Ca^{2+})**
- **Chloride (mg/L as Cl^-)**
- **Temperature (Celcius)**
- **Conductivity (mS)**

If orthophosphate residual levels less than 3.1 mg/L as PO_4 (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as PO_4 (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

Corrosion Control Treatment Test Loops

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. The U.S. EPA has also offered to provide analytical services to support this investigative effort. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or lytle.darren@epa.gov.

Lead Service Line Verification Sampling

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for samples meeting the criteria for inclusion in the 90th percentile calculation for lead and copper compliance must ~~is expected to~~ be completed by a certified lab. The City of Flint may wish to conduct this lead service line investigative sampling in cooperation with the U.S. EPA, which has offered to provide analytical services.

Customer Household Exposure Assessment

The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis samples meeting the criteria for inclusion in the 90th percentile calculation for lead and copper must ~~is expected to~~ be completed by a certified lab. The City of Flint may wish to conduct the investigative service line and premise plumbing sampling in cooperation with the U.S. EPA, which has offered to provide analytical services. It is also recommended that any additional research monitoring should be further evaluated by the City's Technical Advisory Committee prior to being conducted.

Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

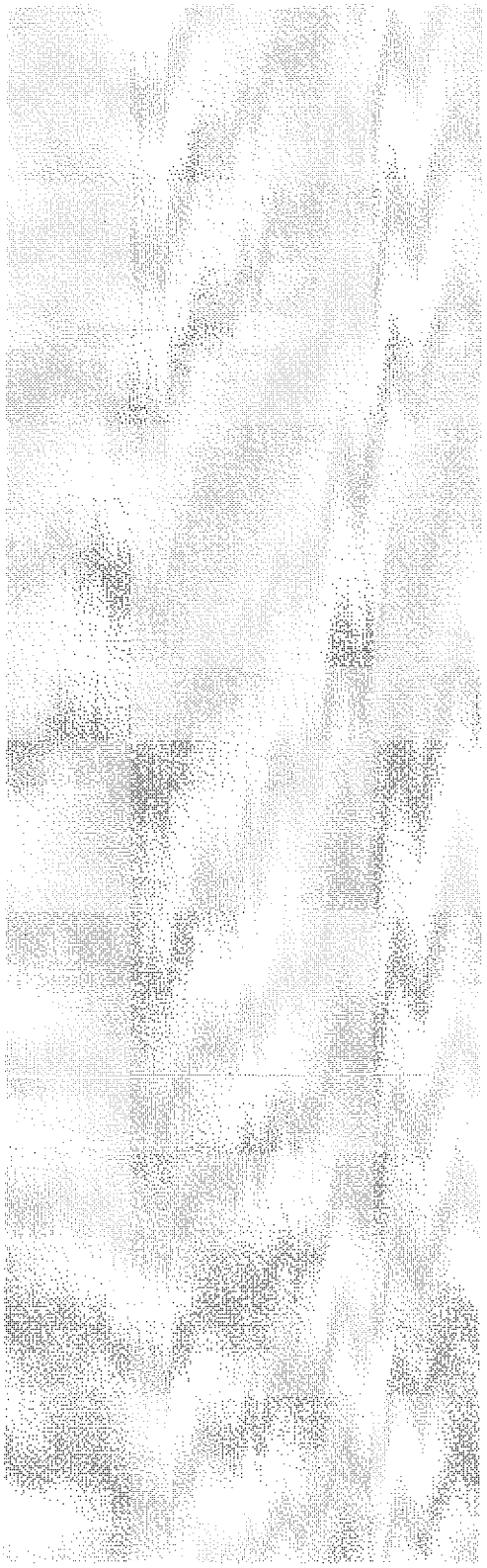
If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,

Michael F. Prysby, P.E.
District Engineer
Field Operations Section
Office of Drinking Water and
Municipal Assistance
517-290-8817

cc: Mr. Brent Wright, City of Flint
Mr. Howard Croft, City of Flint
Ms. Natasha Henderson, City of Flint
Mr. Darren Lytle, U.S. EPA
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.
Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ

DRAFT



DRAFT

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, October 30, 2015 4:36 PM
To: Kaplan, Robert
Subject: RE: EPA Task Force comments on letter sending Flint Corrosion Control Permit
Attachments: Flint CCT Operation Letter 10-30-15.pdf

Bob,
Thanks for the edits. Attached is a copy of the letter sent to the City of Flint today. We have made some minor edits but did emphasize that EPA is available for doing analysis and that a certified lab must analyze any sample that will be used tin the calculation of the 90 percentile of the Lead/Copper rule. We also added the additional point for sampling beyond the ten identifies.
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The Task Force believes Flint should implement the additional corrosion control treatment as soon as possible. The letter and amended permit are an important step in making sure additional corrosion control takes place quickly and appropriately.

- Bob

Robert Kaplan
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U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

Mr. Mike Glasgow
Utilities Administrator
City of Flint
4500 North Dort Highway
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as PO_4, and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as PO_4. As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

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Sincerely,

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Mr. James Henry, Genesee County Health Department
Dr. Linda Dykema, MDHHS
Mr. Jim Sygo, Chief Deputy Director, MDEQ
Mr. Stephen Busch, MDEQ
Mr. Adam Rosenthal, MDEQ

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, October 30, 2015 5:18 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: EPA Task Force comments on letter sending Flint Corrosion Control Permit

Many thanks, Jim. Good luck with the sampling this weekend. Glad we were able to work through these issues together.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Friday, October 30, 2015 4:36 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: RE: EPA Task Force comments on letter sending Flint Corrosion Control Permit

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Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Kaplan, Robert

From: Kaplan, Robert
Sent: Tuesday, November 03, 2015 11:28 AM
To: 'Sygo, Jim (DEQ)'
Subject: RE: EPA Task Force comments on letter sending Flint Corrosion Control Permit

Hi Jim,

Can you give me a call when you get a chance? Phone is below. - Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, November 06, 2015 2:33 PM
To: Kaplan, Robert
Subject: Release on Monday

Bob,
I should be able to get the info to you on the Freeman School data and report prepared first thing on Monday morning.

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, November 06, 2015 2:56 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Release on Monday

Thanks, Jim.

- Bob

Robert Kaplan
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U.S. EPA Region 5
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From: Kaplan, Robert
Sent: Friday, November 06, 2015 3:42 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Release on Monday

Hi Jim,

One more thing – I spoke to Natasha on Wednesday. She said that she had not received MDEQ's permit yet. It could be those documents were sent elsewhere in the City. I asked her to call you to make sure the permit, calculations, and transmittal letter had all been sent to Flint. I hope the City has all of this now so corrosion control can proceed as quickly as possible.

Thanks. -- Bob

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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, November 06, 2015 3:53 PM
To: Kaplan, Robert
Subject: RE: Release on Monday

I met with the Flint Group today and She told me that she now has the hard copy of the permit. They hope to have installation of the Corrosion Control Equipment be operational before the end of the month.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, November 06, 2015 4:42 PM
To: Sygo, Jim (DEQ)
Subject: RE: Release on Monday

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One more thing – I spoke to Natasha on Wednesday. She said that she had not received MDEQ's permit yet. It could be those documents were sent elsewhere in the City. I asked her to call you to make sure the permit, calculations, and transmittal letter had all been sent to Flint. I hope the City has all of this now so corrosion control can proceed as quickly as possible.

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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Monday, November 09, 2015 9:11 AM
To: Kaplan, Robert
Subject: Release of Data from City of Flint Schools
Attachments: Freeman Elementary Report Final.pdf; Freeman Elementary Final Lead and Copper Results.xlsx

Bob,
Attached is the information to be rele3ased today regarding the sampling efforts at the Freeman Elementary School. Please keep this internal t EPA until noon today.

Of 381 samples delivered to the state lab fro free lead testing from homes in the City of Flint, 381 samples have been delivered.
Of the 381 samples delivered, 77% were 5 ppb of lead or less.
Of the 381 samples delivered, 92% were 15 ppb of lead or less.
About 8% of the samples delivered were above 15 ppb for lead.

HHS will be releasing blood results later this week we believe.

We will be3 putting this information on the States web page later today.

If you have any questions, please feel free to contact me.

By the way, we have sent a letter today to the City regarding Lead/Copper monitoring information that had been certified by the City, requesting additional information.
Their certifications have been questioned by some and they are pointing to the State program. As you know this is the responsibility of the water supplier under the Lead/Copper rule.

FREEMAN ELEMENTARY SCHOOL

Outlet Sampling and Plumbing Assessment Recommendations

4001 Ogema Avenue, Flint, MI 48507

DEQ

BACKGROUND INFORMATION

On Friday, October 23, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of Freeman Elementary School's plumbing system to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

- Lead solder joints on copper piping
- Brass valves and brass fittings
- Brass components in fixtures
- Galvanized piping

The assessment also identified 31 faucets or fountains that provide water for drinking, cooking, and/or food preparation. The team developed a sequence for sampling the 31 faucets/fountains based on how the water travels through the building.

On Saturday, October 24, 2015, the DEQ and the DLARA completed sampling of the 31 faucets/fountains, in the order determined by the plumbing assessment from the previous day, following a stagnation period of 12 hours. At each of the 31 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2) were collected immediately after turning on the tap. The water was then flushed for 30 seconds, and a third 125-milliliter sample (F1) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F2) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

On Saturday, October 31, 2015, the DEQ completed consecutive sampling at three of the 31 faucets/fountains following a stagnation period of 12 hours. This sampling was used to determine the impact of any lead sources located deep in the supply plumbing. The three sites included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these three sites, staff collected 10, 1-liter samples. The 10 samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between.

WATER SERVICE INFORMATION

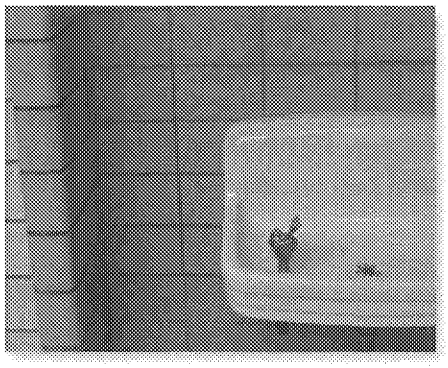
A four-inch diameter cast iron water service line enters the school in the boiler room on the west wall. Piping in the boiler room immediately transitions into galvanized metal piping for cold water lines. Two separate galvanized cold water supply lines exit the boiler room. One in the northeast corner appears to serve the gym, auditorium, and proposed pre-K facilities on the north end of the school. The other exits the boiler room in the southwest corner and appears to serve the remainder of the school to the south, including the library. This line was also found to have grounding connections attached to the piping. Hot water is distributed in continuous loops that feed from and return to a central water heater in the boiler room. Hot water piping material, where exposed, was copper piping with 50/50 lead solder joints. Brass valves were seen throughout the building.

Outlets With Lead Levels Greater Than 15 Parts per Billion

The DEQ recommends school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 31 faucets/fountains on October 24, 2015, the following nine drinking water outlets had lead water level results greater than 15 parts per billion. Each of these nine outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

Outlet: Bubbler Drinking Fountain, Left (DW001)

Location: Hallway outside Janitorial Room
Results: P1=40 parts per billion, P2=6 parts per billion
F1=4 parts per billion, F2=1 part per billion

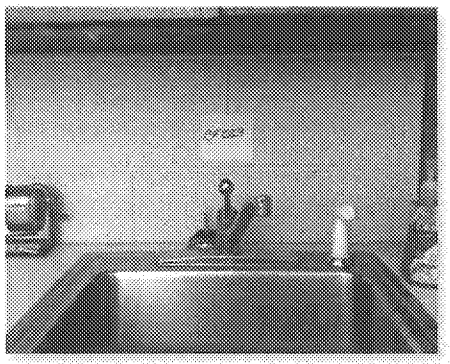


These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is believed to have a brass valve. The connection underneath the sink also appears to have some brass components, including the valve at the wall.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF029)

Location: DHHS Office, west wall
Results: P1=17 parts per billion, P2=12 parts per billion
F1=2 parts per billion, F2=non-detect



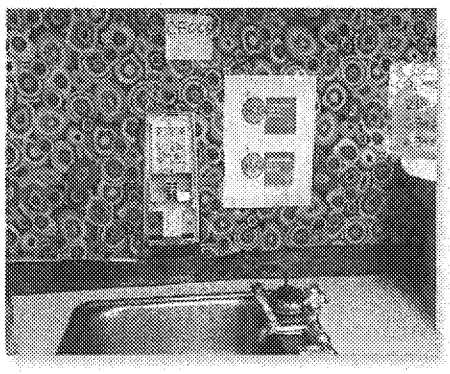
These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The faucet is a Delta 400. This model faucet valve has brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink may also contain brass components.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Integrated faucet and bubbler fountain (CF006)

Location: Classroom 2, south wall
Results: P1=16 parts per billion, P2=3 parts per billion
F1=1 part per billion, F2=1 part per billion

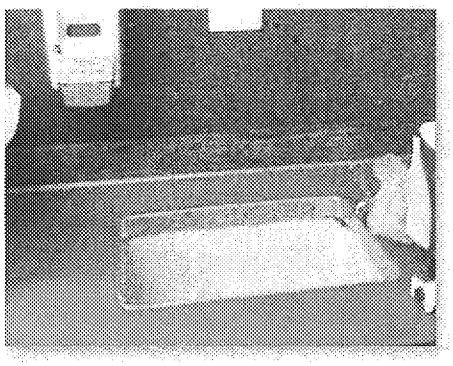


These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.

Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Integrated faucet and bubbler fountain (CF014)

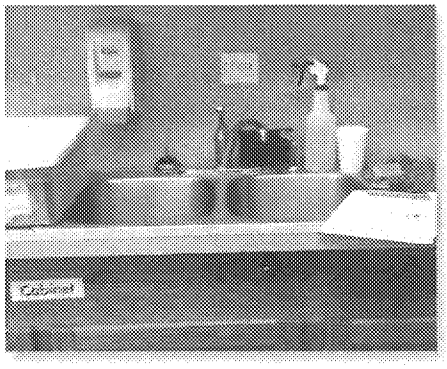
Location: Classroom 10, north wall
Results: P1=27 parts per billion, P2=7 parts per billion
F1=4 parts per billion, F2=3 parts per billion



These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself and its connecting plumbing. The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple. Connecting plumbing in the cabinet under the sink may also contain brass components.

Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF013)



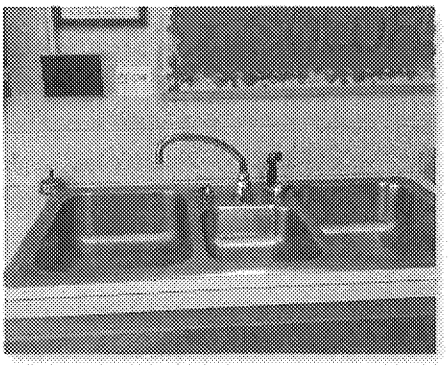
Location: Classroom 10, north wall
Results: P1=9 parts per billion, P2=18 parts per billion
F1=3 parts per billion, F2=3 parts per billion

These results suggest the highest contribution of lead may be from the connecting plumbing with some contribution from the faucet itself. The faucet appears to be a Delta 500 series. This model faucet may have some brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink should be checked for brass components, including brass valves.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF015)



Location: Classroom 11, northeast corner
Results: P1=102 parts per billion, P2=326 parts per billion
F1=14 parts per billion, F2=11 parts per billion

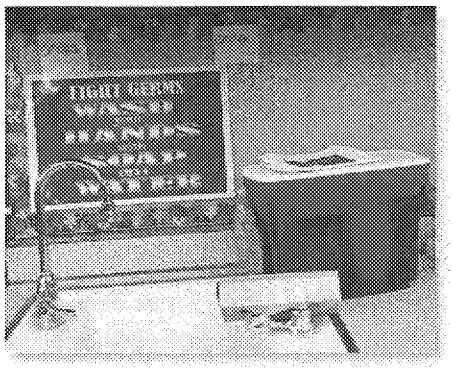
These results suggest the highest contribution of lead may be from the connecting plumbing and from the faucet itself. The faucet is an older design that uses a brass tube approximately 8 inches in length between the hot and cold water valves and connects to the outlet under the sink. This brass tube may be the primary source of lead, explaining the higher second (P2) sample result. The faucet and valves may also contain brass components. Connecting plumbing in the cabinet under the sink should be checked for additional brass components, including brass valves.

This faucet also has an aerator at the outlet. The aerator should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator should be periodically checked and cleaned.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and needs to be completed. If replacement is not currently feasible, **DO NOT USE THIS FAUCET FOR DRINKING OR COOKING.**

Outlet: Integrated faucet and bubbler fountain (CF024)

Location: Classroom 19, east wall
Results: P1=23 parts per billion, P2=3 parts per billion
F1=4 part per billion, F2=3 parts per billion

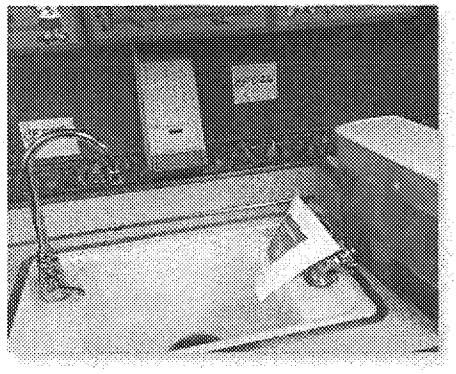


These results were collected from the faucet portion of the fixture and suggest the highest contribution of lead may be from the fixture itself. The make and model of this fixture is unknown, but appears to be made of chrome plated brass and may be connected on the underside of the sink using a brass nipple.

Replacement of this fixture and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler fountain (CF026)

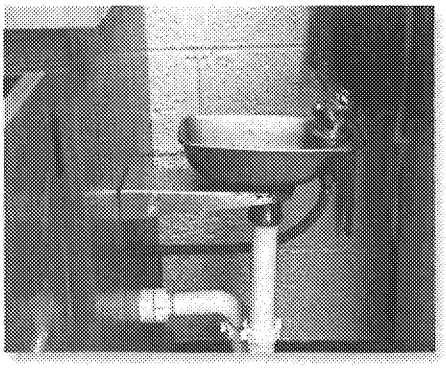
Location: Classroom 14, west wall
Results: P1=36 parts per billion, P2=30 parts per billion
F1=17 parts per billion, F2=4 parts per billion



These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This style bubbler typically has a 4-5-inch brass fitting that connects to a 3-inch brass nipple on the underside of the sink. This would explain the higher concentrations in the first two sample results. The connection underneath the sink may also have some brass components and should be checked, including the valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes prior to each use and for at least 4 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure. **In general, use of this fountain for drinking water should be discouraged.**

Outlet: Bubbler fountain (CF031)



Location: Proposed Pre-K Room, south wall
Results: P1=57 parts per billion, P2=3 parts per billion
F1=2 parts per billion, F2=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture appears to be made of chrome plated brass. This bubbler has a brass fitting connection to a brass nipple. The connector hose is not expected to be contributing lead.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location and should be completed. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 22 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

The fourth sample at each of these 22 outlets following approximately 3 minutes of use and flushing at a reduced flow reduced lead concentrations to 4 parts per billion or less. This indicates that flushing of all taps used for drinking, cooking, and/or food preparation for 4 minutes following periods of stagnation will further reduce lead exposure. It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance.

Twelve of these outlets are comprised of similar materials as the outlets listed above and could potentially experience higher lead levels under extended periods of stagnation. These faucets/fountains include:

- Sink Side Bubbler Units in Classroom 12 (CF022), Classroom 5 (CF009), Classroom 21 (CF028), Hallway Fountain (DW002), Classroom 15 (CF018), Classroom 17 (CF020), and Classroom 1 (DW005).
- Integrated Faucet Bubbler Fountain Units in Classroom 6 (CF010), Classroom 9 (CF012), Classroom 4 (CF008), Classroom 3 (CF007), and Classroom 7 (CF011).

Replacement of these fixtures with lead-free materials is also recommended.

The remaining 10 outlets showed sample results of 15 parts per billion or less, requiring no further action or additional recommendations. These faucets/fountains include:

- Sink Faucets in Classroom 1 (CF004), Classroom 15 (CF017), Classroom 17 (CF019), Classroom 12 (CF021), Classroom 19 (CF023), Classroom 14 (CF025), Classroom 21 (CF027), and Proposed Pre-K Room (CF030).
- Kitchen Sink (cold) in the Community Room (KC003).
- Sink Side Bubbler Fountain in Classroom 11 (CF016).

Consecutive Sampling Results and Building Plumbing Recommendations

The consecutive samples taken at three sites in the building on October 31, 2015, provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the school building.

Consecutive Sample No.	1	2	3	4	5	6	7	8	9	10
LOCATION	LEAD RESULT (PARTS PER BILLION; ND = NOT-DETECTED)									
Proposed Pre-K Rm Sink Faucet (CF030)	2	1	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 11 Sink Faucet (CF015)	62	8	8	7	7	7	7	6	6	6
Classroom 21 Sink Faucet (CF027)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

The continued presence of lead in samples collected at Classroom 11 (CF015) may be a result of lead particulates caught in the aerator/screen installed on the faucet outlet or may be from a source of lead further back in the plumbing system. However, the non-detect results from consecutive samples collected in Proposed Pre-K Room (CF030) and Classroom 21 (CF027) suggest any additional source of lead associated with Classroom 11 (CF015) is localized to the plumbing branch serving this faucet. The faucet aerator/screen in Classroom 11 (CF015) should be removed and inspected before completing a more in-depth plumbing analysis. Consecutive sampling results at Classroom 11 (CF015) support the water use restrictions specified for this outlet.

ANALYTE	RESULT (mg\L)	Sample Location	Sample Description	Site Code	Site Code Description
Lead	0.010	Classroom 12	CF022	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 12	CF022	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 12	CF022	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Classroom 12	CF022	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.004	Classroom 12	CF021	P1	First Primary draw of 125 milliliters
Lead	0.007	Classroom 12	CF021	P2	Second Primary draw of 125 milliliters
Lead	0.000	Classroom 12	CF021	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 12	CF021	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.009	Classroom 5	CF009	P1	First Primary draw of 125 milliliters
Lead	0.002	Classroom 5	CF009	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 5	CF009	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Classroom 5	CF009	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.102	Classroom 11	CF015	P1	First Primary draw of 125 milliliters
Lead	0.426	Classroom 11	CF015	P2	Second Primary draw of 125 milliliters
Lead	0.014	Classroom 11	CF015	F01	Flush Sample taken 30 Seconds after Second
Lead	0.011	Classroom 11	CF015	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.003	Classroom 11	CF016	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 11	CF016	P2	Second Primary draw of 125 milliliters
Lead	0.005	Classroom 11	CF016	F01	Flush Sample taken 30 Seconds after Second
Lead	0.004	Classroom 11	CF016	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.009	Classroom 21	CF027	P1	First Primary draw of 125 milliliters
Lead	0.007	Classroom 21	CF027	P2	Second Primary draw of 125 milliliters
Lead	0.000	Classroom 21	CF027	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 21	CF027	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.012	Classroom 6	CF010	P1	First Primary draw of 125 milliliters
Lead	0.004	Classroom 6	CF010	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 6	CF010	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 6	CF010	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.009	Classroom 21	CF028	P1	First Primary draw of 125 milliliters
Lead	0.002	Classroom 21	CF028	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 21	CF028	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Classroom 21	CF028	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.022	Classroom 19	CF024	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 19	CF024	P2	Second Primary draw of 125 milliliters
Lead	0.004	Classroom 19	CF024	F01	Flush Sample taken 30 Seconds after Second
Lead	0.003	Classroom 19	CF024	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.005	Community Room	KC003	P1	First Primary draw of 125 milliliters
Lead	0.002	Community Room	KC003	P2	Second Primary draw of 125 milliliters
Lead	0.000	Community Room	KC003	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Community Room	KC003	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.009	Classroom 19	CF023	P1	First Primary draw of 125 milliliters
Lead	0.009	Classroom 19	CF023	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 19	CF023	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 19	CF023	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.015	Hallway	DW002	P1	First Primary draw of 125 milliliters
Lead	0.006	Hallway	DW002	P2	Second Primary draw of 125 milliliters
Lead	0.004	Hallway	DW002	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Hallway	DW002	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.002	Classroom 9	CF012	P1	First Primary draw of 125 milliliters
Lead	0.004	Classroom 9	CF012	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 9	CF012	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 9	CF012	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.010	Hallway	DW001	P1	First Primary draw of 125 milliliters
Lead	0.006	Hallway	DW001	P2	Second Primary draw of 125 milliliters
Lead	0.004	Hallway	DW001	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Hallway	DW001	F02	Flush Sample taken 2 minutes after First Flush

ANALYTE	RESULT (mg\L)	Sample Location	Sample Description	Site Code	Site Code Description
Lead	0.014	Classroom 15	CF018	P1	First Primary draw of 125 milliliters
Lead	0.005	Classroom 15	CF018	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 15	CF018	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 15	CF018	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.010	Classroom 15	CF017	P1	First Primary draw of 125 milliliters
Lead	0.014	Classroom 15	CF017	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 15	CF017	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 15	CF017	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.017	DHHS Office	CF029	P1	First Primary draw of 125 milliliters
Lead	0.012	DHHS Office	CF029	P2	Second Primary draw of 125 milliliters
Lead	0.002	DHHS Office	CF029	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	DHHS Office	CF029	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.013	Classroom 4	CF008	P1	First Primary draw of 125 milliliters
Lead	0.006	Classroom 4	CF008	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 4	CF008	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 4	CF008	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.007	Classroom 3	CF007	P1	First Primary draw of 125 milliliters
Lead	0.006	Classroom 3	CF007	P2	Second Primary draw of 125 milliliters
Lead	0.003	Classroom 3	CF007	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 3	CF007	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.017	Classroom 10	CF014	P1	First Primary draw of 125 milliliters
Lead	0.007	Classroom 10	CF014	P2	Second Primary draw of 125 milliliters
Lead	0.004	Classroom 10	CF014	F01	Flush Sample taken 30 Seconds after Second
Lead	0.003	Classroom 10	CF014	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.015	Classroom 14	CF026	P1	First Primary draw of 125 milliliters
Lead	0.014	Classroom 14	CF026	P2	Second Primary draw of 125 milliliters
Lead	0.017	Classroom 14	CF026	F01	Flush Sample taken 30 Seconds after Second
Lead	0.004	Classroom 14	CF026	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.005	Classroom 17	CF019	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 17	CF019	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 17	CF019	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 17	CF019	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.000	Classroom 14	CF025	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 14	CF025	P2	Second Primary draw of 125 milliliters
Lead	0.003	Classroom 14	CF025	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 14	CF025	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.009	Classroom 10	CF013	P1	First Primary draw of 125 milliliters
Lead	0.018	Classroom 10	CF013	P2	Second Primary draw of 125 milliliters
Lead	0.003	Classroom 10	CF013	F01	Flush Sample taken 30 Seconds after Second
Lead	0.003	Classroom 10	CF013	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.013	Classroom 17	CF020	P1	First Primary draw of 125 milliliters
Lead	0.004	Classroom 17	CF020	P2	Second Primary draw of 125 milliliters
Lead	0.005	Classroom 17	CF020	F01	Flush Sample taken 30 Seconds after Second
Lead	0.003	Classroom 17	CF020	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.016	Classroom 2	CF006	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 2	CF006	P2	Second Primary draw of 125 milliliters
Lead	0.001	Classroom 2	CF006	F01	Flush Sample taken 30 Seconds after Second
Lead	0.001	Classroom 2	CF006	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.002	Classroom 7	CF011	P1	First Primary draw of 125 milliliters
Lead	0.000	Classroom 7	CF011	P2	Second Primary draw of 125 milliliters
Lead	0.002	Classroom 7	CF011	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Classroom 7	CF011	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.017	Proposed Pre K	CF031	P1	First Primary draw of 125 milliliters
Lead	0.003	Proposed Pre K	CF031	P2	Second Primary draw of 125 milliliters
Lead	0.002	Proposed Pre K	CF031	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Proposed Pre K	CF031	F02	Flush Sample taken 2 minutes after First Flush

ANALYTE	RESULT (mg\L)	Sample Location	Sample Description	Site Code	Site Code Description
Lead	0.010	Proposed Pre K	CF030	P1	First Primary draw of 125 milliliters
Lead	0.003	Proposed Pre K	CF030	P2	Second Primary draw of 125 milliliters
Lead	0.007	Proposed Pre K	CF030	F01	Flush Sample taken 30 Seconds after Second
Lead	0.000	Proposed Pre K	CF030	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.012	Classroom 1	CF004	P1	First Primary draw of 125 milliliters
Lead	0.007	Classroom 1	CF004	P2	Second Primary draw of 125 milliliters
Lead	0.004	Classroom 1	CF004	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 1	CF004	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.005	Classroom 1	DW005	P1	First Primary draw of 125 milliliters
Lead	0.003	Classroom 1	DW005	P2	Second Primary draw of 125 milliliters
Lead	0.003	Classroom 1	DW005	F01	Flush Sample taken 30 Seconds after Second
Lead	0.002	Classroom 1	DW005	F02	Flush Sample taken 2 minutes after First Flush
Lead	0.002	Proposed Pre K	CF030	CA1	First Sequential Sample
Lead	0.001	Proposed Pre K	CF030	CA2	Second Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA3	Third Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA4	Forth Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA5	Fifth Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA6	Sixth Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA7	Seventh Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA8	Eigth Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA9	Ninth Sequential Sample
Lead	0.000	Proposed Pre K	CF030	CA10	Tenth Sequential Sample
Lead	0.002	Classroom 11	CF015	CB1	First Sequential Sample
Lead	0.008	Classroom 11	CF015	CB2	Second Sequential Sample
Lead	0.008	Classroom 11	CF015	CB3	Third Sequential Sample
Lead	0.007	Classroom 11	CF015	CB4	Forth Sequential Sample
Lead	0.007	Classroom 11	CF015	CB5	Fifth Sequential Sample
Lead	0.007	Classroom 11	CF015	CB6	Sixth Sequential Sample
Lead	0.007	Classroom 11	CF015	CB7	Seventh Sequential Sample
Lead	0.006	Classroom 11	CF015	CB8	Eigth Sequential Sample
Lead	0.006	Classroom 11	CF015	CB9	Ninth Sequential Sample
Lead	0.006	Classroom 11	CF015	CB10	Tenth Sequential Sample
Lead	0.002	Classroom 21	CF027	CC1	First Sequential Sample
Lead	0.000	Classroom 21	CF027	CC2	Second Sequential Sample
Lead	0.000	Classroom 21	CF027	CC3	Third Sequential Sample
Lead	0.000	Classroom 21	CF027	CC4	Forth Sequential Sample
Lead	0.000	Classroom 21	CF027	CC5	Fifth Sequential Sample
Lead	0.000	Classroom 21	CF027	CC6	Sixth Sequential Sample
Lead	0.000	Classroom 21	CF027	CC7	Seventh Sequential Sample
Lead	0.000	Classroom 21	CF027	CC8	Eigth Sequential Sample
Lead	0.000	Classroom 21	CF027	CC9	Ninth Sequential Sample
Lead	0.000	Classroom 21	CF027	CC10	Tenth Sequential Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting

Results in RED exceed 15 ppb
1 ppb = 0.001 mg\L

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, November 13, 2015 3:05 PM
To: Kaplan, Robert
Subject: Flint Drinking Water Lead/Copper Sampling Instructions
Attachments: Letter to Addressed to Resident.pdf

Attached is the proposed language proposed by the City of Flint for their next sampling effort.
Please provide any comments that you or task force members may have by close of business November 20, 2015.

Dear Resident,

The City of Flint Utility Division has recently amended our lead and copper testing procedure and are now using a NO-FLUSH protocol. The new method is designed to provide a more accurate gauge of the amount of lead exposure that may exist in the plumbing.

We are requesting that all residents who have had their water tested for lead and copper submit to another test so that we may provide you with a current report. The City has multiple methods available for you to arrange another water test, obtain a water filter, or a replacement cartridge:

1) Call the Water Treatment Plant at 810-787-6537
2) Call Our DPW Service Specialist at 810-766-7105 x 2606
3) Email flintwater@cityofflint.com
4) Come in to the INFORMATION window in the Lobby of City Hall

Bottles for water testing can be picked up at the Water Treatment Plant or at City Hall. You may also arrange for bottles to be delivered to your individual home or business. We ask that you please encourage other neighbors and residents to get their water tested as well by sharing this information with them.

Thank you,

Sincerely,

Mike Glasgow
Utilities Administrator
810-787-6537 x 3512

Howard Croft
Public Works Director
810-766-7346 x 2043

Drinking Water Lead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in your drinking water. It is important that you follow these instructions so that we may collect an accurate measurement of the lead and copper in your drinking water. This sample is supposed to represent the water you would typically drink and the faucet from where you would drink the water. Call your water supply if you have any questions.

1. Select a faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT sample from a laundry sink or a hose spigot as these samples cannot be used by your utility.

2. Wait at least 6 hours before collecting your sample but we do not recommend sampling if the faucet has sat idle for more than 12 hours.

3. Fill the sample bottle to the neck with the "first draw" of COLD water.

4. Please answer the following questions:

a) What date and time did you **fill the bottle**? Date _____ Time _____ A.M.

b) Which faucet did you use to fill the bottle? ☐ Kitchen ☐ Main Bathroom ☐ Other
If OTHER, please describe: _____

C) Is this faucet connected to a home treatment device such as a water softener, a reverse osmosis unit, an iron removal device OR is any kind of additive used in the home? ☐ Yes ☐ No
If YES, please describe: _____

Your Printed Name _____

Your Address _____

_____

Your Signature _____

5. Attach this form to the bottle and leave it outside your front door and call to arrange pick up.

If you have any questions about sampling call:

Water Supply: City of Flint

Manager or Water Operator: Brent Wright

Phone: (810) 787-6537

To schedule sample pick up call:

Wendy Braun: (810) 766-7135 ext. 2606

Thanks again for your help. Information on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year. We will send you the results within 30 days of receiving them. Contact your utility if you have any questions.

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, November 18, 2015 10:55 AM
To: 'Sygo, Jim (DEQ)'
Subject: RE: HHS Protocol for sampling homes that have blood levels over 5

Jim,

Got it, thanks. We will not release, and we will be able to meet your schedule without a problem.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Wednesday, November 18, 2015 10:52 AM
> **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> **Subject:** HHS Protocol for sampling homes that have blood levels over 5
>
> Bob,
> Attached is the proposed protocol to be utilized for the sampling of homes where children with blood serum levels over 5 have been identified. These homes will be evaluated completely by HHS for sources of lead exposure. If the task force has any comments please try to get them to me by November 24.
>
> **Please do not release outside of EPA until the protocol is final.**
>
> **We are working on the protocol for LCR sampling that the city will use for their next collection period and should have that to you for comments by the end of the week.**

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, November 20, 2015 1:14 PM
To: Kaplan, Robert
Subject: Compliance Monitoring Instructions For Flint's next testing period.
Attachments: Notices to Flint Residents.pdf

Bob,
Attached is a document and letter that Howard put together before he left. This is based on the discussion at the last TAC meeting.
My staff have provided several recommended changes, but we also want the Task Force to weigh in.
Remember this document will be used for Flint's Compliance Monitoring under the LCR starting in January.

Today Flint advised that they will be having a contractor identify Tier 1 sites with lead lines to me monitored.

If you could have this back to us by December 4, 2015 that would be appreciated.

Drinking Water Lead & Copper Sampling Instructions

Dear Resident:

Thank you for helping to monitor for lead and copper in your drinking water. It is important that you follow these instructions so that we may collect an accurate measurement of the lead and copper in your drinking water. This sample is supposed to represent the water you would typically drink and the faucet from where you would drink the water. Call your water supply if you have any questions.

1. Select a faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT sample from a laundry sink or a hose spigot as these samples cannot be used by your utility.
2. Wait at least 6 hours before collecting your sample but we do not recommend sampling if the faucet has sat idle for more than 12 hours. (Samples taken with a stagnation greater than 18 Hours may not be analyzed
3. Fill the sample bottle to the neck with the "first draw" of COLD water.
4. Please answer the following questions:

   a) What date and time did you **fill the bottle**? Date _____ Time _____ A.M.

   b) Which faucet did you use to fill the bottle? ☐ Kitchen ☐ Main Bathroom ☐ Other
   If OTHER, please describe: _____

   C) Is this faucet connected to a home treatment device such as a water softener, a reverse osmosis unit, an iron removal device OR is any kind of additive used in the home? ☐ Yes ☐ No
   If YES, please describe: _____

   Your Printed Name _____

   Your Address _____

   _____

   Your Signature _____

5. Attach this form to the bottle and leave it outside your front door and call to arrange pick up.

If you have any questions about sampling call:

Water Supply: City of Flint

Manager or Water Operator: Brent Wright

Phone: (810) 787-6537

To schedule sample pick up call:

Wendy Braun: (810) 766-7135 ext. 2606

2nd sentence ~~If your sample is part of~~ compliance ~~Information~~ 3rd sentence ~~Thanks~~ again for your help. ~~Information~~ on this year's lead and copper monitoring will be printed in the *Consumer Confidence Report* that will be made available to you by July 1 of next year. We will send you the results within 30 days of receiving them. Contact your utility if you have any questions.

Since not all samples can be used for compliance determination, Probably need different language here.

Dear Resident,

The City of Flint Utility Division has recently amended our lead and copper testing procedure and are now using a NO-FLUSH protocol. ~~The new method is designed to provide a more accurate gauge of the amount of lead exposure that may exist in the plumbing.~~

We are requesting that all residents who have had their water tested for lead and copper submit to another test so that we may provide you with a current report. The City has multiple methods available for you to arrange another water test, obtain a water filter, or a replacement cartridge:

1) Call the Water Treatment Plant at 810-787-6537
2) Call Our DPW Service Specialist at 810-766-7105 x 2606
3) Email flintwater@cityofflint.com
4) Come in to the INFORMATION window in the Lobby of City Hall

Bottles for water testing can be picked up at the Water Treatment Plant or at City Hall. You may also arrange for bottles to be delivered to your individual home ~~or business~~. We ask that you please encourage other neighbors and residents to get their water tested as well by sharing this information with them.

Thank you,

Sincerely,

Mike Glasgow
Utilities Administrator
810-787-6537 x 3512

Howard Croft
Public Works Director
810-766-7346 x 2043

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, November 18, 2015 10:52 AM
To: Kaplan, Robert
Subject: HHS Protocol for sampling homes that have blood levels over 5
Attachments: Draft EBL Water Protocol 18Nov15.docx

Bob,
Attached is the proposed protocol to be utilized for the sampling of homes where children with blood serum levels over 5 have been identified. These homes will be evaluated completely by HHS for
sources of lead exposure. If the task force has any comments please try to get them to me by November 24.

Please do not release outside of EPA until the protocol is final.

We are working on the protocol for LCR sampling that the city will use for their next collection period and should have that to you for comments by the end of the week.

DRAFT – WORK IN PROGRESS

Protocol for Collecting Residential Drinking Water Samples for Lead Analysis

The following protocol will be used by the Michigan Department of Health and Human Services (MDHHS) to ensure that residential drinking water samples are collected in a systematic, consistent manner as part of an elevated blood lead (EBL) investigation. The results will be used to evaluate human exposure to lead in household drinking water and to identify plumbing components that are contributing lead to household drinking water.

MDHHS will:

- Collect water samples from the kitchen faucet used for drinking and cooking; a secondary faucet, most likely a bathroom sink; and any additional faucets based on frequency of use for consumptive purposes.
- Collect two small volume [125 milliliter (mL)] first-draw samples from selected cold faucet to evaluate exposure to lead in drinking water.
- Collect ten large volume [1 liter (L)] sequential samples from the kitchen cold faucet to identify plumbing components that are contributing lead to the household water supply.
- Incorporate the results of water testing into the EBL investigation report.

Before the EBL Inspection

Obtain information about the age of the house and any building additions. Identify if there are any records of previous water testing in the past two years. If possible, obtain information about the materials used in the water service line (lead, galvanized, copper or plastic).

Instruct residents not use any water in the house for any purpose (including toilet flushing) for at least 6 hours prior to sample collection.

Step 1 – Prior to Sample Collection

Sampling staff should confirm upon arrival at the home that no water has been used in the home for at least 6 hours prior to sample collection.

Step 2 – Identify and Label the Sample Faucets

- Identify the primary cold kitchen faucet.
- Identify a secondary cold faucet based on use: most likely a bathroom sink.
- Identify any additional cold faucets that are frequently used.

Identify each sampling location on the interior floor plan. Document each sampling location with digital photos, including the connections beneath the sink. Note the presence of any potential brass components or treatment devices, and whether the faucet has an aerator. Document other noteworthy items for each location such as leaky faucet, rust stained sink, etc. Document any exposed plumbing in the basement, if possible.

If a temporary in-line filter is installed on the faucet, use the by-pass lever to collect unfiltered water samples. A whole house filter does not preclude sampling, as this is a permanent filter and representative of actual exposure.

Each water sample must be given a unique identification (ID) code that identifies the location of the faucet, the sample volume, and the order of sample collection.

Faucet location is indicated as follows:

- KF = kitchen faucet, cold
- BF = bathroom faucet, cold
- OF = other faucet, cold (specify type)

The two 125-mL first draw samples are labeled in order of collection P1 and P2. For example, the ID codes for the bathroom faucet samples would be BF-P1 and BF-P2.

The 10 large volume 1-L sequential samples collected from the kitchen faucet are labeled A1 through A10. For example, the first sequential sample at the kitchen faucet is labeled KF-A1, the second is labeled KF-A2 ... through KF-A10.

Step 3 – Collect the Small Volume Samples

Before sample collection:

1. Write the assigned ID code on each sample bottle's green label using a black Ultra Fine Point Sharpie permanent marker. To ensure clarity for the DEQ lab, draw a slash mark through each zero, the number one is a straight vertical line (no hat or foot), and cross each number seven.
2. Next, remove the cap from each bottle and label using a red Fine Point Sharpie permanent marker. Write '1' on the white cap of the bottle marked as P1; write '2' on the cap of the bottle marked as P2. Caps must be placed open side up to avoid contamination when not on the bottle.
3. Complete the *Request for Analysis* forms for each sample using a pen, pencil or black Sharpie. If the Lead and Copper analyses is not already selected, mark as 32CC for the 125-mL samples.

Collect 125-mL samples from all secondary faucets before collecting any samples from the primary kitchen faucet. Collect the P1 sample as the very first-draw from each faucet, followed by the P2 sample.

DO NOT REMOVE THE AERATOR IF THERE IS ONE, but make a notation that there is an aerator present.

Sample collection:

1. Place the P1 bottle under the faucet, open the faucet to produce a moderate, steady stream and fill the first bottle to the appropriate level. Immediately fill the P2 bottle without a break in the stream (do not turn off the faucet between the first and second bottle and do not allow water to run down the drain in between the first and second bottle if at all possible).
2. Turn off faucet. Cap each sample bottle making sure to match the P1 sample to the '1' white cap, and the P2 sample to the '2' white cap.
3. Secure the appropriate request for water analysis form to each bottle (refer to the example bottle provided for "instructions") with a rubber band.
4. Bundle the P1 and P2 samples collected at each faucet (after the proper paperwork has been banded to each bottle) and secure them together with a single rubber band.

Step 4 – Collect the Large Volume Samples

After all 125-mL samples have been collected; collect ten sequential 1-L samples from the kitchen cold faucet.

Before sample collection:

1. Write the assigned ID code on each sample bottle's green label using a black Ultra Fine Point Sharpie permanent marker. To ensure clarity for the DEQ lab, draw a slash mark through each zero, the number one is a straight vertical line (no hat or foot), and cross each number seven.
2. Next, remove the cap from each bottle and label using a red Fine Point Sharpie permanent marker. Write 1 through 10 on the white caps of the 1-L bottles for the A1 through A10 sequential samples. Caps must be placed open side up to avoid contamination when not on the bottle.
3. Complete the Request for Analysis forms for each sample using a pen, pencil or black Sharpie. If the Lead and Copper analyses is not already selected, mark as 36CC for the 1-L samples.

Sample collection:

1. Place the A1 bottle under the faucet, open the faucet to produce a moderate, steady stream and fill the first bottle to the appropriate level. Immediately fill bottles A2 to A10 consecutively without a break in the stream (do not turn off the faucet between bottles and do not allow water to run down the drain between the bottles).
2. After all 1-L samples are collected, turn off faucet. Cap each sample bottle making sure to match the A1 sample to the '1' white cap, the A2 sample to the '2' white cap and so forth.

3. Secure the appropriate request for water analysis form to each bottle (refer to the example bottle provided for "instructions") with a rubber band.

Step 5 - Deliver all sample bottles to the DEQ Drinking Water Laboratory.

The DEQ Drinking Water Laboratory will analyze all water samples in accordance with the Laboratory Services Standard Operating Procedure (SOP) Document SOP #800 Revision #4 Effective Date 10/2015.

Applicable analytical methods will be in accordance with the *Method for Determination of Metals in Environmental Samples, Supplement I,* U.S. Environmental Protection Agency, Method 200.8, 1999 Revision 5.5.

All Method Detection Limits shall be performed according to Title 40 of the Code of Federal Regulations, Part 136, Guidelines Establishing Testing Procedures for the Analysis of Pollutants, Appendix B, Definition and Procedure for the Determination of the Method Detection Limit.

Analytical quality control will be in accordance with SOP #800 Revision #4.

Kaplan, Robert

From: Kaplan, Robert
Sent: Monday, November 23, 2015 11:41 AM
To: 'Sygo, Jim (DEQ)'
Subject: Flint Task Force Comments on MDEQ Residential Sampling Instructions
Attachments: Task Force Comments on MDEQ Residential Sampling Instructions 11-20-15

Jim,

Thanks for the opportunity to comment on the MDEQ Flint Residential Sampling Instructions. Attached please find the Task Force comments.

- Bob

Flint Drinking Water Task Force (FTF 15-2)

Task Force Comments on Flint's Residential Drinking Water Lead & Copper Sampling Instructions

EPA received the draft of Flint's Residential "Drinking Water Lead & Copper Sampling Instructions" for comment from Jim Sygo, MDEQ, on November 13, 2015. Below are comments from EPA's Flint Safe Drinking Water Task Force.

General

It should be clearly stated that these sampling instructions are for LCR compliance monitoring – from now on without the pre-flushing.

Specific Comments

1. The Task Force agrees with the removal of pre-flushing.

2. In the "Dear Resident" cover paragraph, we suggest changing the text "...provide a more accurate gauge of the amount of lead exposure...", because though this is a much better representation of the water intended to be captured by the LCR, it DOES NOT REPRESENT EXPOSURE. We suggest: "The new method is designed to provide a more accurate gauge of lead levels at the tap under normal household use using the current regulatory sampling requirements." We recommend that when the residents are sent their results, that it includes an explanation that the result does not represent lead exposure and that first draw samples have been found to underestimate lead levels in direct contact with a lead service line. It is recommended that customers continue to use the water filters that have been provided to minimize lead exposure.

3. Item 1 needs to require that samples be unfiltered/untreated. Samples may be taken from either a kitchen or bathroom faucet commonly used for drinking, provided the faucet used has no filter attached or the filter has been bypassed. Instructions need to be provided on how to bypass the faucet mount filters that have been distributed. Other home treatment devices must be bypassed too. If the resident has questions about how to bypass a treatment device, they should call the water supply.

Depending on which Flint and MDEQ feel would be more easily understood by residents, the following are two potential alternatives to current Item 1 that would ensure only untreated/unfiltered samples are collected:

Alternative 1

Select an unfiltered/untreated faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT use a faucet that has a filter attached to it unless you bypass the filter. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or a hose spigot as these samples cannot be used by your utility.

Flint Drinking Water Task Force (FTF 15-2)

Alternative 2

1: Does the kitchen tap have a faucet mount filter or a reverse osmosis unit on it? If NO, go to 1a. If YES, go to 1b.

a) Select a faucet in the KITCHEN or BATHROOM that is commonly used for drinking. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or hose spigot as these samples cannot be used by your utility.

b) Select a BATHROOM faucet that is commonly used and does not have a treatment device attached to it. DO NOT use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device. DO NOT sample from a laundry sink or hose spigot as these samples cannot be used by your utility.

There should be a question on the form asking if the resident has installed a faucet mount filter, so this can be recorded (see suggested change to 4C in comment 6 below). [Note: Installing the faucet mount filter would require the removal of the faucet's aerator. Does MDEQ know if the faucet mount filters being used have an aerator screen in the unit?]

4. On Item 2, the LCR currently has no upper limit on standing time, and we have published research data showing that under normal usage conditions, lead release may not have even reached equilibrium at 12 hours. The minimum of 6 hours stagnation time is used rather than a longer time so as not to discourage people from volunteering to take lead and copper samples. Therefore, for consistency with the text of the rule, we recommend just leaving it at "Wait at least 6 hours..." We understand it's not useful to collect from totally inappropriate conditions, such as vacant houses and immediately after extended vacations, but the introductory paragraph clarifies that it represents the water they would "typically drink." If it is necessary to have a maximum stagnation time, then we recommend that you use a maximum of 24 hours which is consistent with the approach that was discussed with the National Drinking Water Advisory Council Working Group as an option in 2014.

5. Again in Item 2, there must be an instruction to not use the water anywhere in the house during the stagnation period. Depending on the house plumbing configuration and pipe inside diameter (ID), using other taps, toilets, bathtubs, dishwashers, etc. may draw water from the zone of plumbing captured in a 1 liter sample. That will usually cause a low bias to the results, by bringing in fresh water. Only rarely is LSL water brought precisely into that volume captured by the sample. So, instructions need to be clear about no water use in the house.

6. Recommended language for Item 4C (for inventory purposes and to verify that the sample was unfiltered/untreated):

- Does this faucet have a faucet mount filter such as the lead filters provided to the community? Yes/No

  - If Yes, was the faucet mount filter bypassed during the sampling? Yes/No
- Is this faucet connected to a reverse osmosis unit? Yes/No
  - If Yes, was the reverse osmosis unit bypassed during the sampling? Yes/No
- Does the house have a home treatment device, such as a water softener or iron removal device or any other type of water treatment? Yes/No
  - If Yes, please describe _____
  - Was this home treatment device in use during sampling or the day before sampling? Yes/No

7. In our experience, and in the experience of other utilities who try to use the LCR monitoring data to assess effectiveness of their treatment for the control of lead release, the form should ask for the resident to note the approximate time of last use of that faucet from which the sample is taken, as well as the time the bottle is filled. Since the typical 6-12 hour period is not really at equilibrium in most cases, soluble lead could differ by a substantial amount from a 6 hour standing sample to, say, a 10 or 12 hour standing sample. When interpreting the data, that is good to know.

8. Not covered by the questions, but a recommendation we need to make, is to suggest that there is good research evidence that higher flow rates are the typical conditions for when consumers turn their faucets on. More particulate lead can be eroded in some circumstances, so using a wide-mouth bottle allows a much more representative sample to be collected for the conditions of consumer use. Our understanding is that MDEQ furnishes the bottles, so we recommend to change the type of bottle provided. The furnished bottles with the smaller mouth can only be filled without splashing at flow rates that are much lower than what someone normally uses to fill glasses, coffee pots, pots for cooking, etc.

These changes should be made to all of the sampling recommendations or instructions from MDEQ to all systems, not just Flint.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Tuesday, November 24, 2015 11:22 AM
To: Kaplan, Robert
Subject: Eisenhower Elementary School Report
Attachments: EisenhowerElementary_Report.pdf

Attached is the second report which has been finished.
We have now sampled 8 of the 13 public schools and hope to catch up on the reports over the next 2 weeks.

EISENHOWER ELEMENTARY SCHOOL

Outlet Sampling and Plumbing Assessment Recommendations

1235 Pershing Street, Flint, Michigan 48503

DEQ

BACKGROUND INFORMATION

On Friday, October 30, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of Eisenhower Elementary School's plumbing system to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. Two outlet buildings in addition to the main school building were included in the assessment. The assessment identified the following potential sources of lead leaching into drinking water:

- Lead solder joints on copper piping
- Brass valves and brass fittings
- Brass components in fixtures
- Galvanized piping

The assessment also identified 43 faucets or fountains that provide water for drinking, cooking, and/or food preparation, 37 faucets/fountains in the main school building, four faucets/fountains in out building unit 1, and two faucets/fountains in out building unit 2. The team developed a sequence for sampling the faucets/fountains in each building based on how the water travels through each building.

On Saturday, October 31, 2015, the DEQ and the DLARA completed sampling of the 37 faucets/fountains in the main school building, the four faucets/fountains in out building unit 1, and the two faucets/fountains in out building unit 2, each in the order determined by the plumbing assessment from the previous day, following a stagnation period of over 12 hours. At each of the 43 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F01) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F02) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

The DEQ and the DLARA then completed consecutive sampling at three of the 37 faucets/fountains in the main school building, one of the four faucets/fountains in out building unit 1, and one of the two faucets/fountains in out building unit 2, five sites in total. This consecutive sampling was used to determine the impact of any lead sources located deep in the supply plumbing at each of these buildings. The three sites in the main school building included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these five sites, staff collected 10, 1-liter samples. The 10 samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between.

WATER SERVICE INFORMATION

A four-inch diameter cast iron water service line enters the main school building in the boiler room northwest wall located in the west corner of the building. Piping in the boiler room immediately transitions into galvanized metal piping for cold water lines. Three separate galvanized cold water supply lines exit the boiler room. One in the north corner serves a single hose bib directly outside the boiler room. A second line exits the southeast wall and serves the adjacent janitors closet and dressing room bathrooms. The third line exits the boiler room on the northeast side through a utility tunnel that runs below the school hallways and serves all rooms in the main school building. This supply line then runs between the first and second floors on the southeast end of

the building. Copper piping with lead solder joints branches off of the galvanized supply line for cold water supply to each room. Hot water is distributed in continuous loops that feed from and return to a central water heater in the boiler room. Hot water piping material, where exposed, was copper piping with lead solder joints. Brass valves were seen throughout the building.

Out building unit 1 has a separate customer service line from the City water main constructed using copper piping material. The service line comes out of the ground beneath the building and within the building is copper pipe with lead free solder joints.

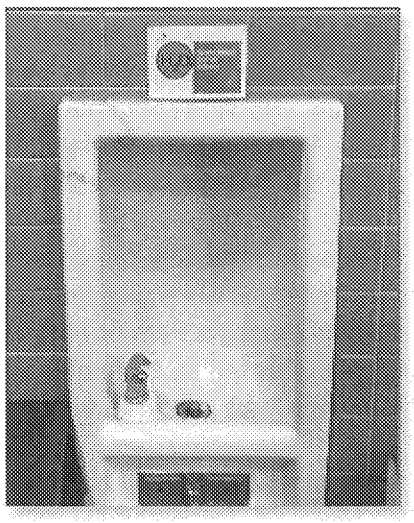
Out building unit 2 has a separate customer service line from the City water main constructed using copper piping material. The service line comes out of the ground beneath the building and within the building is copper pipe with lead free solder joints.

Outlets With Lead Levels Greater Than 15 Parts per Billion

The DEQ recommends school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 43 faucets/fountains on October 31, 2015, the following 18 drinking water outlets had lead water level results greater than 15 parts per billion. Each of these 18 outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

Outlet: Bubbler Drinking Fountain (01DW001)

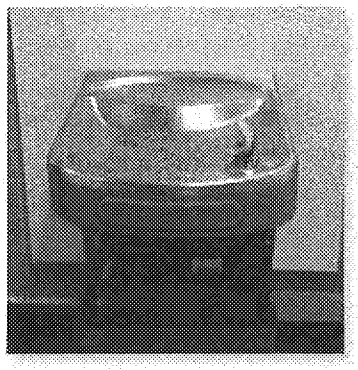
Location: West corner, Gymnasium Multipurpose Room
Results: P1=32 parts per billion, P2=6 parts per billion
F01=5 parts per billion, F02=3 parts per billion



These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass and is believed to have a brass valve. The connection piping with the unit may also contain some brass components.

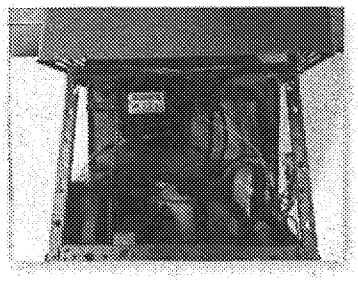
Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Water Cooler Fountain (01WC002)



Location: Hallway between Gym and Auditorium, northeast side
Results: P1=17 parts per billion, P2=17 parts per billion
F01=12 parts per billion, F02=3 parts per billion

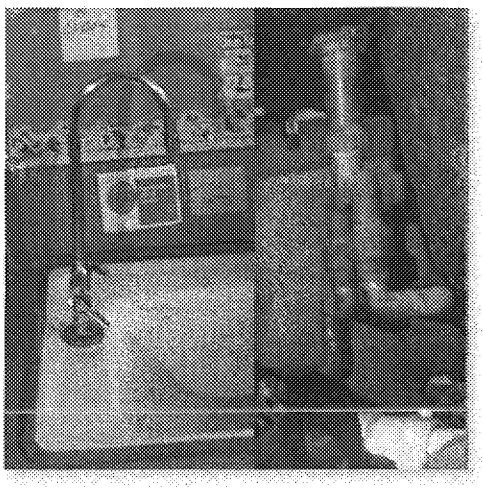
These results suggest the highest contribution of lead may be from the water cooler unit. The water cooler is an Elkay model LKEZFS8. This model contains some brass components. Connecting plumbing to the cooler unit may also contain brass components.



Replacement of the entire unit is recommended and will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (01CF004)

Location: Classroom 109, northwest wall
Results: P1=17 parts per billion, P2=10 parts per billion
F01=1 part per billion, F02=2 parts per billion

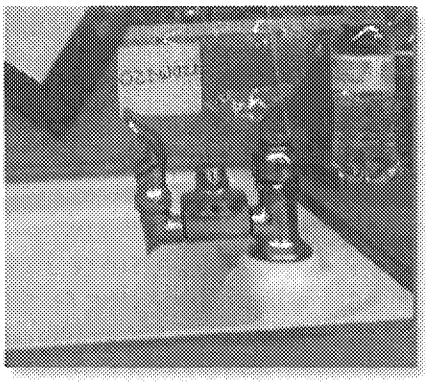


These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Hot and cold water lines connect to this faucet with a brass mixer fitting under the sink. Connecting plumbing in the cabinet under the sink may also contain additional brass components.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Bubbler Fountain (02DW020)

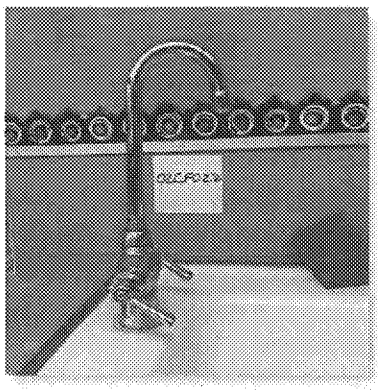


Location: Classroom 201, southeast wall
Results: P1=37 parts per billion, P2=24 parts per billion
F01=2 parts per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. The bubbler also has a chrome plated brass flow regulator installed between the operating valve and the outlet. The connecting plumbing is copper with lead solder and includes a brass shut off valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (02CF022)



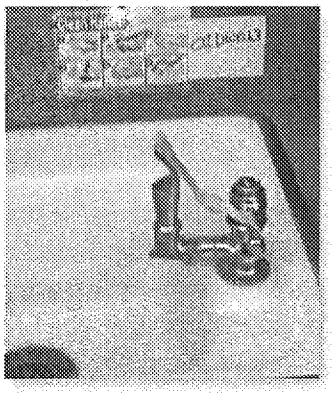
Location: Classroom 202, northwest wall
Results: P1=7 parts per billion, P2=24 parts per billion
F01=2 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink is made up of brass connectors; copper piping with lead solder and brass shut off valves.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Bubbler Fountain (01DW013)

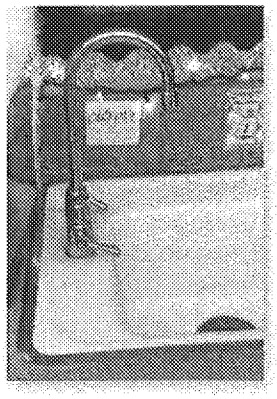


Location: Classroom 104, southwest wall
Results: P1=43 parts per billion, P2=106 parts per billion
F01=3 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. Connecting plumbing in the cabinet under the sink is made up of brass connectors; copper piping with lead solder, and a brass shut off valve.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (01CF014)



Location: Classroom 104, southwest wall
Results: P1=36 parts per billion, P2=36 parts per billion
F01=2 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink is made up of brass connectors; copper piping with lead solder and brass shut off valves.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

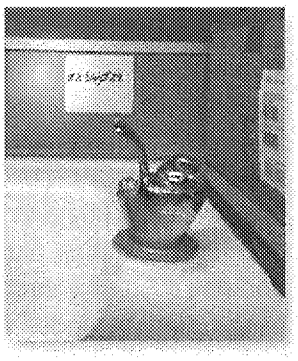
Outlet: Bubbler Fountain (02DW027)

Location: Classroom 204, southwest wall
Results: P1=18 parts per billion, P2=8 parts per billion
F01=2 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. The bubbler also has a chrome plated brass flow regulator installed between the operating valve and the outlet. The connecting plumbing is copper with lead solder and includes a brass shut off valve.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Fountain (02DW029)



Location: Classroom 205, northeast wall
Results: P1=39 parts per billion, P2=14 parts per billion
F01=11 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. Connecting plumbing in the cabinet under the sink is made up of brass connectors and copper piping with lead solder.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

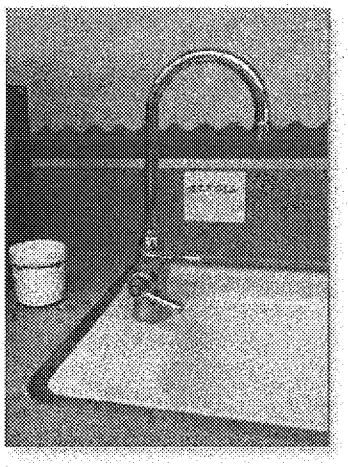
Outlet: Bubbler Fountain (02DW031)

Location: Classroom 206, southwest wall
Results: P1=84 parts per billion, P2=7 parts per billion
F01=1 part per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. The bubbler also has a chrome plated brass flow regulator installed between the operating valve and the outlet. Connecting plumbing in the cabinet under the sink should be checked for brass components and copper piping with lead solder.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (01CF016)



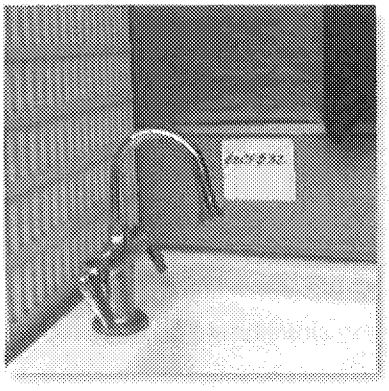
Location: Classroom 106, northeast wall
Results: P1=402 parts per billion, P2=61 parts per billion
F01=4 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink is partly made up of brass connectors; copper piping with lead solder, and brass shut off valves.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Sink Faucet (02CF032)

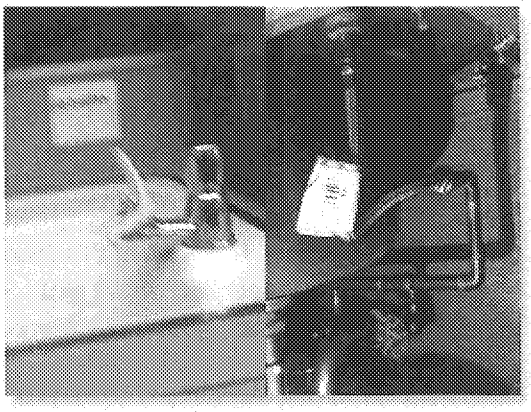


Location: Classroom 207, northeast wall
Results: P1=21 parts per billion, P2=23 parts per billion
F01=5 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink is partly made up of brass connectors; copper piping with lead solder, and brass shut off valves.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Fountain (02DW033)

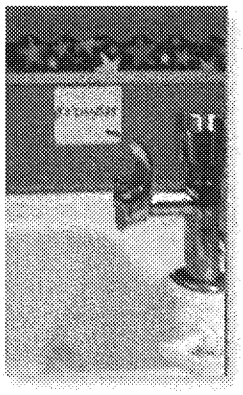


Location: Classroom 207, northeast wall
Results: P1=20 parts per billion, P2=4 parts per billion
F01=3 parts per billion, F02=3 parts per billion

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. Parts of this bubbler fixture are made of brass and it has a brass connector on the underside of the sink. Connecting plumbing in the cabinet under the sink is partly made up of brass connectors; copper piping with lead solder, and a brass shut off valve.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Fountain (02DW035)



Location: Classroom 208, southwest wall
Results: P1=12 parts per billion, P2=19 parts per billion
F01=6 parts per billion, F02=3 parts per billion

These results suggest the highest contribution of lead may be from the bubbler and its connecting plumbing. This bubbler fixture is made of chrome plated brass and has a brass connector on the underside of the sink. Connecting plumbing in the cabinet under the sink should be checked for brass components and copper piping with lead solder.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (02CF034)

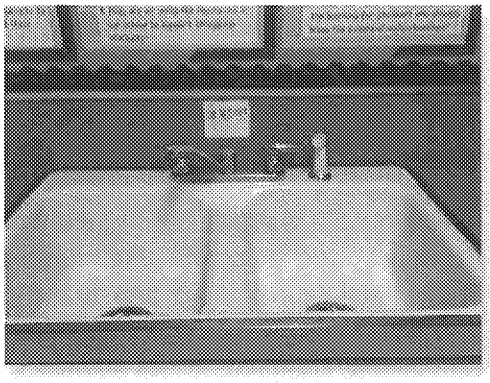
NO IMAGE AVAILABLE

Location: Classroom 208, southwest wall
Results: P1=19 parts per billion, P2=12 parts per billion
F01=3 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink should be checked for brass components and copper piping with lead solder.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Kitchen Faucet (01KC019)



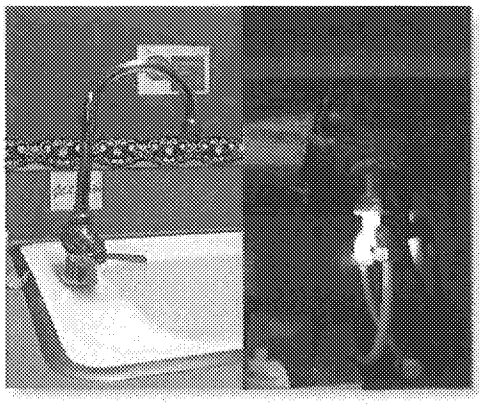
Location: Room 108, southwest wall
Results: P1=17 parts per billion, P2=5 parts per billion
F01=4 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. This fixture appears to be a Delta two handled faucet. This model faucet typically has a brass tube in its deck body and may contain some additional brass components. Connecting plumbing in the cabinet under the sink should be checked for brass components and copper piping with lead solder.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Sink Faucet (02CF036)



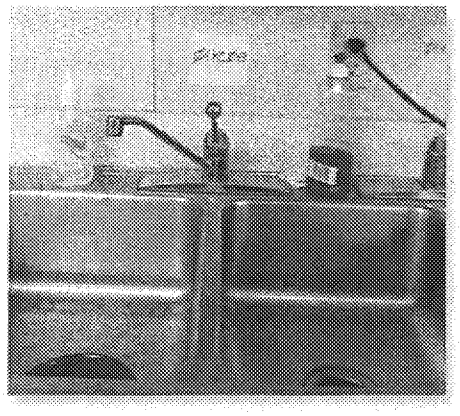
Location: Classroom 209, southwest wall
Results: P1=7 parts per billion, P2=21 parts per billion
F01=5 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Hot and cold water lines connect to this faucet with a brass mixer fitting under the sink. Connecting plumbing in the cabinet under the sink may also contain additional brass connectors and copper plumbing with lead solder.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Kitchen Faucet, Left (04KC043)



Location: Outbuilding Unit 2 DHHS Office
Results: P1=17 parts per billion, P2=3 parts per billion
F01=2 parts per billion, F02=3 parts per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The faucet is a Delta 400. This model faucet valve has brass components. This style faucet also has a mixing valve that may allow mixing of hot and cold water. Connecting plumbing in the cabinet under the sink may also contain brass components.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for 3 minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 25 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

The fourth sample (F02) at all 43 outlets following approximately 3 minutes of use and flushing at a reduced flow resulted in reduced lead concentrations of 3 parts per billion or less. This indicates that flushing of all taps used for drinking, cooking, and/or food preparation for 4 minutes following periods of stagnation will further reduce lead exposure. It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance with emphasis on flushing after weekends and holidays.

Seventeen of these twenty five outlets are comprised of similar materials as the outlets listed above and could potentially experience higher lead levels under extended periods of stagnation. These faucets/fountains include:

- Sink Side Bubbler Units in Classroom 109 (01DW003), Classroom 101 (01DW007), Classroom 102 (01DW009), Classroom 202 (02DW023), Classroom 103 (01DW011), Classroom 203 (02DW025), Classroom 106 (01DW015), Classroom 107 (01DW017), and Classroom 209 (02DW037)
- Chrome Plated Brass Base Faucets in Classroom 101 (01CF008), Classroom 201 (02CF021), Classroom 103 (01CF012), Classroom 203 (02CF024), Classroom 204 (02CF026), Classroom 205 (02CF028), and Classroom 107 (01CF018)
- Delta 400 Model Faucet in Out Building Unit 2 (04KC044)

Replacement of these fixtures with lead free materials is also recommended.

The remaining eight outlets showed sample results of 15 parts per billion or less, requiring no further action or additional recommendations. These faucets/fountains include:

- Sink Faucets in Classroom 102 (01CF010) and the Clinic (01CF006)
- Kitchen Faucets in the Community Room Kitchen (01KC005), Classroom 206 (02CF030), Out Building Unit 1 (03KC040 and 03KC041)
- Water Coolers in Out Building Unit 1 (03DW038 and 03DW039)

Consecutive Sampling Results and Building Plumbing Recommendations

The consecutive samples taken on October 31, 2015, at three sites in the main school building and one site from each of the two out building units all provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the main school building or the two out building units. Results of the consecutive sample monitoring are listed in the table below.

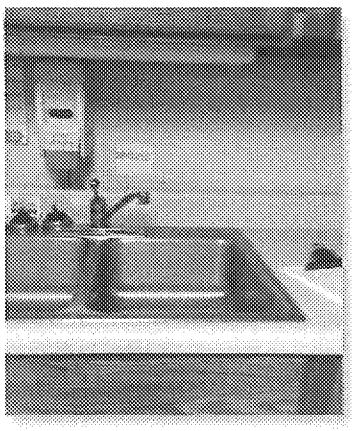
Consecutive Sample No.	1	2	3	4	5	6	7	8	9	10
LOCATION	LEAD RESULT (PARTS PER BILLION; ND = NOT-DETECTED)									
Classroom 109 Sink Faucet (01CF004)	3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 102 Sink Faucet (01CF010)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 209 Sink Faucet (02CF036)	3	1	1	1	ND	ND	ND	ND	ND	ND
Out Building Unit 1 Kitchen Faucet (03KC040)	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Out Building Unit 2 Kitchen Faucet (04KC044)	2	ND	ND	ND	ND	ND	1	1	ND	ND

Outlets With Copper Levels Greater Than 1.3 Parts per Million

The DEQ recommends school facilities take action if samples from any drinking water outlets show copper levels greater than 1.3 parts per million. Based on the sampling conducted at 43 faucets/fountains on October 31, 2015, the following two drinking water outlets both located in Outbuilding Unit 1, had copper water level results greater than 1.3 parts per million. These two outlets are listed below with their sample results. While the remaining two outlets in Outbuilding Unit 1 had satisfactory copper results, copper results from all four outlets in Outbuilding Unit 1, along with the consecutive sample results for Outbuilding Unit 1, suggests that copper leaching is occurring in the building plumbing and copper service line due to excessive stagnation and lack of use. Additional work with the school will be performed by the DEQ to address this issue.

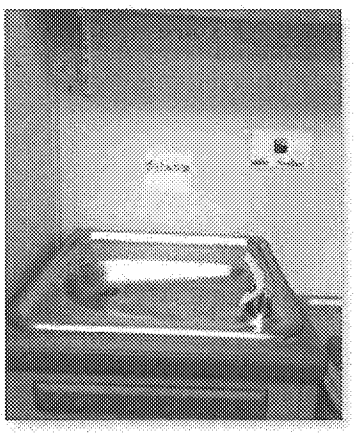
Outlet: Kitchen Faucet, Left (03KC041)

Location: Outbuilding Unit 1, Proposed Preschool
Results: P1=0.33 parts per million, P2=1.84 parts per million
F01=1.07 parts per million, F02=1.12 parts per million



Outlet: Water Cooler, Left (03DW038)

Location: Outbuilding Unit 1, Proposed Preschool
Results: P1=2.77 parts per million, P2=1.37 parts per million
F01=1.2 parts per million, F02=1.03 parts per million



Kaplan, Robert

From: Kaplan, Robert
Sent: Tuesday, November 24, 2015 1:58 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Eisenhower Elementary School Report

Jim, thanks very much. -- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Tuesday, November 24, 2015 11:22 AM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: Eisenhower Elementary School Report

Attached is the second report which has been finished.
We have now sampled 8 of the 13 public schools and hope to catch up on the reports over the next 2 weeks.

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, November 25, 2015 9:01 AM
To: Sygo, Jim (DEQ)
Subject: EPA Flint Task Force -- Draft Preliminary Assesment for discussion
Attachments: EPA Task Force Recommendations Final Draft November 24 2015.pdf

Jim,

As we discussed on the call yesterday, I've attached the draft Task Force Recommendations for optimization of corrosion control, both for current water supply and for the switch to KWA water). We wanted to share this draft with MDEQ first and get feedback prior to our meeting on December 11. Note that several sections are omitted pending further discussion, including specific funding estimates and outreach to Flint.

Thanks,

Bob

Flint Drinking Water Task Force (FTF-3)

Optimization and Maintenance of Optimal Corrosion Control Treatment

Preliminary Assessment

U.S. EPA Flint Task Force

11/24/2015

DRAFT

1.0 Overview

The United States Environmental Protection Agency (EPA) has offered, and the City of Flint has accepted, the assistance of EPA experts on corrosion and corrosion control. This preliminary assessment is intended to document the activities and funding necessary to enable EPA to provide advice and support to the City of Flint in optimizing and maintaining corrosion control treatment under current water quality conditions as well as during and after the upcoming transition to the Karegnondi Water Authority (KWA) pipeline.

[Note: There are many other communities scheduled to transition from their current water sources to the KWA pipeline. Although the source water will be the same for the City of Flint and all communities transitioning to the KWA pipeline source, the intended treatment planned for these communities may differ and the studies undertaken for the City of Flint may or may not be suitable for use by the other communities. It is strongly recommended that the EPA Task Force discuss with the Michigan Department of Environmental Management (MDEQ) the importance of actively working with these additional communities to ensure that proper studies on optimizing and maintaining OCCT are undertaken prior to putting the new KWA source in service for all affected communities. If such studies are not currently underway, they should be initiated as soon as possible.]

2.0 Information Request

In order to provide effective advice and assistance, the EPA Task Force should request the following information from the City of Flint.

2.1 Current inventory of homes with service line information in excel or similar format.

Pipe loops are corrosion control treatment assessment tools that enable evaluation of the effects of potential water quality changes and different levels of orthophosphate treatment on the existing pipe scales in order to select the most effective treatment before the treatment is applied on a city-wide basis. The pipe loops utilize lead service lines that are actively in service and carefully extracted so that the treatment assessment is conducted with pipes that represent conditions within the distribution system. As it would not be possible to perform service line extractions in the winter without significantly altering or dislodging the scales within the pipes, the identification and extraction of lead service lines should be given the highest priority to ensure that a sufficient number of lead pipes can be identified and extracted as soon as possible. In order to identify suitable homes with lead lines, the EPA Task Force will need current records on lead service line locations to be provided as soon as possible so that sampling can be coordinated and conducted to verify the presence of lead lines.

To minimize the need for excavation, homes with the longest lead service lines should be chosen so that multiple segments can be harvested from each lead line. The lead lines would typically be the longest where the water main is located across the street from the home and the home is set back on the property with respect to the street. An estimated 20 lead pipe segments should be carefully extracted and handled using ORD-specified procedures for use in constructing pipe loops at the treatment plant.

As the scales within the service lines have been subject to significant and iterative water quality changes in a relatively short period of time, it is also necessary to extract additional lead and non-lead portions of service lines to assess the current condition of the scales within the service lines.

2.2. All lead in water testing results for City of Flint, including those not used for Lead and Copper Rule compliance.

Studies have shown that homes served by lead service lines generally have much higher lead levels than homes without lead service lines. As it is anticipated that the City of Flint's service line records will be incomplete, the lead-in-water testing data is a supplemental tool that can be mapped to identify areas of the city that may have higher lead-in-water levels which would indicate the presence of lead service lines. This information will help the EPA Task Force in the identification and extraction of lead service lines for constructing the pipe loops and in identification of areas to test the progress of corrosion control.

2.3 Identification of areas in Flint with elevated blood lead levels.

Similar to the lead-in-water testing, identification of areas (e.g., zip codes, neighborhoods) where blood lead levels have increased since the switch to the Flint River can provide additional data which would indicate the presence of lead service lines for the identification of areas to test the progress of corrosion control.

2.4 Addresses of homes that have had water service interruptions or street disturbances (e.g., water main breaks, road/sidewalk construction, etc.) within the last year.

Streets where there have been potential physical disturbances and homes where the water service has been interrupted should be prioritized for evaluation for the presence of lead service lines as the disturbances can release very high lead and prolonged stagnation can affect the stability of the scales within the pipes.

2.5 Addresses of currently unoccupied homes.

Similar to homes where the water service has been interrupted, homes that are unoccupied should be prioritized for evaluation for the presence of lead service lines as these homes may pose a significant risk to incoming occupants if the home has a lead service line. Recently unoccupied homes also may provide important evaluation locations of water usage impacts on scale stability and lead release/exposure.

2.6 Identification of the pressure zones and location of each of the water quality parameter locations (addresses) within each pressure zone used for water quality parameter measurements (pH, alkalinity, orthophosphate, chlorine, total Coliform) in the distribution system, along with copies of the water quality parameter analytical results for past 4 rounds of monitoring.

In addition to corrosion control treatment optimization, the City of Flint must simultaneously comply with all other applicable National Primary Drinking Water Regulations (NPDWRs). A system-wide assessment of the water quality will provided information necessary to ensure that any potential issues with other NPDWRs can be identified and resolved. Information regarding the water quality in the distribution system is necessary to evaluate the stability of the water quality parameters throughout the distribution system, and to detect locations that may have the highest risk of lead release, TTHM formation, or the presence of microbial contamination.

3.0 Immediate Tasks and Timeline

The following tasks should be undertaken immediately (November/December 2015)

3.1 Determination on EPA funding commitment(s) (DRA).

3.2 Discussion with Central Regional Laboratory (CRL) regarding laboratory capabilities and support (GWDWB, ORD).

3.3 Development of EPA QAPPs encompassing the following activities (GWDWB, ORD, Others*):

- 3.3.1 Verification of presence of lead service lines*;
- 3.3.2 Pipe rig construction, operation, and maintenance;
- 3.3.3 Treatment assessment monitoring;
- 3.3.4 Evaluation of lead reservoirs within service lines; and
- 3.3.5 Evaluation of scale degradation due to stagnation events at unoccupied homes and water shut-offs*.

*If these activities are undertaken by one or more of the local partners, QAPP development should be part of the agreement.

3.4 Identification of local partners that can coordinate with the EPA Flint Task Force, MDEQ, and the City of Flint, and establishment of agreements to provide assistance on field and other activities (ORD).
[Potential local partners who have expressed strong interest and willingness to collaborate with EPA include Wayne State University, University of Michigan Flint, Michigan State University, Hurley Medical Center, and Genesee County Health Department.]

3.5 Outreach and education – specifics to be determined.
[Potential local partners Hurley and WSU have asked ORD directly if EPA can provide training/education for their staff on lead in water occurrence, sampling for lead, and corrosion/corrosion control treatment]

3.6 Assessment of information from 2.1 to verify the presence of a sufficient number of accessible homes with lead service lines that can be extracted for construction of pipe loops and to evaluate the current state and stability of the scales within the lead and non-lead portions of service lines (TBD).

3.7 Extraction of approximately twenty lead line segments with active water for construction of pipe loops, and six additional full service lines with different pipe material (two with lead and galvanized iron, two with lead and copper, and two with lead and plastic segments) for analyzing the lead reservoirs within the lead and non-lead segments of the service lines (TBD).

3.8 Risk evaluation and communication on the potential risk from physical disturbances to lead service lines, reoccupation of unoccupied homes and re-establishment of water service following water shut-offs (TBD).

4.0 Funding Needs (To Be Determined)

5.0 Proposed EPA Assistance

The narrative below describes the scope of work to be undertaken in providing assistance to the City of Flint and is contingent on adequate funding being provided.

5.1 Lead Service Line Detection Methodology Development

Verification of the presence of lead service lines is necessary for identification and extraction of lead service lines, sampling for treatment assessment, Lead and Copper Rule compliance sampling, risk evaluation and implementation of a lead service line replacement program. Blood lead level (BLL) or other lead-related health evaluations also need to be able to identify all lead sources for blood-tested individuals to prioritize risk locations and mitigation strategies. This methodology development is designed to determine if a simple water sampling protocol can give a convenient means to verify with some level of confidence, whether or not a residence has a lead service line, through relatively non-intrusive water sampling. Experience with other utilities has shown that paper records may either under or overestimate the presence of lead service lines.

The strategy to be employed is based on published protocols with improvements being researched by Polytechnique Montreal (Michele Prevost, Elise Deshommes, Clement Cartier). This requires staffing for coordination with Flint paper records, resident contact, plumbing mapping, field sampling (TBD, but estimated at 20 locations with no LSLs for "control" purposes, and 50 locations believed to have LSL for validation. Development of this protocol could involve re-sampling to test techniques, and could utilize one or more Palintest electrochemical analyzers after validation vs. ICP-MS. EPA-ORD has one Palintest analyzer which can be used. Field personnel would work closely with R5 CRL to test the limits of analytical performance of the Palintest analyzer.

5.2 Corrosion Control Treatment Optimization Evaluations

The corrosion control treatment optimization evaluations are necessarily separated into two stages. The first stage is intended to optimize corrosion control treatment with the current water source and water quality conditions. The second stage is designed to prepare for the transition to the new water source (KWA Pipeline) and water quality conditions, and to ensure that the City of Flint is able to simultaneously comply with all National Primary Drinking Water Regulations following the transition to the new source.

5.2.1 *Short-Term (Current) Lead Release Optimization Evaluation.* A lead pipe rig system will be constructed at the Flint water treatment plant with exhumed lead pipes, carefully collected and installed into the pipe rig. EPA-ORD will provide technical assistance in the rig design and construction, as well as the design provisions for chemical additions. One to two people will be required to be on-site to perform periodic chemical analyses and operate and maintain the pipe rig system, as well as to troubleshoot/repair any problems and to collect samples. Laboratory instruments for pH and colorimetric tests (chlorine residual, orthophosphate) will be needed on site. It is anticipated that the design will include a "control" loop and loops with possibly 3-4 different dosages, in duplicate. The

estimated sampling frequency would be at least three times per week, using ICP for metals and ICP-MS for lead on each sample, with one complete characterization sample before each stagnation period. Filtration apparatus will also be needed.

5.2.2 *Simultaneous Compliance Optimization Pilot Testing Prior to Flint Water Plant Treatment of KWA Water.* This effort will necessarily be more expansive than the short-term evaluation. The same control pipes would carry over, but new pipes would need to be stabilized with the current water. Upstream of the lead pipe rig, there would need to be a series of jar tests or a small pilot plant established to optimize coagulation, softening (if necessary), filtration and disinfection processes to meet disinfection byproduct (DBP) limits and microbial inactivation requirements. Investigations are also needed to assess the potential impacts of different possible treated Lake Huron water qualities on chlorine, biofilm growth, water age, microbial pathogens such as Legionella, phosphate demand and scaling potential. Pilot evaluations could be done on different unit processes using anticipated Lake Huron water, using university-run pilot plants, shipped or trucked water, etc. Some pilot evaluation analyses could be done on-site with portable analytical instrumentation as is typical. When a final water quality target is determined, the target finished water would become the source water to feed into the lead (and metal) pipe rigs, and thereafter the optimization of phosphate dosing would be done on the stabilized exhumed lead pipes in the pipe rigs. A reservoir may need to be constructed to hold processed simulated Lake Huron treated water produced by the pilot plant and fed to the pipe rigs. This evaluation must be started as soon as possible to allow sufficient time for reliable results to avoid having to conduct full-scale testing on water delivered into the distribution system that could impact Flint consumers after the switch to the KWA pipeline is made.

5.3 Lead Source/Release Diagnostic Evaluation

While the data collected from the pipe loops can provide information on the relative effectiveness of various treatment schemes, conditions at the plant are not the same as within the distribution system. Continued monitoring of lead levels at high risk sites throughout the distribution system is needed to make any necessary adjustments based on actual conditions within the distribution system. EPA estimates that approximately 45 homes will need to be identified for ongoing sampling to inform the treatment optimization process. (15 with lead & copper service line portions, 15 with lead & galvanized iron service lines and if available, 15 with lead and plastic service line portions). This evaluation is necessary for determining what the relative contributions of lead are from different plumbing sources in order to assure optimization of lead and other metal release from the service lines and premise plumbing. Two sampling rounds are the minimum expected for profile sampling which will utilize small volume samples through faucet and sink area and larger (one-liter) samples thereafter. Sampling would involve 15 sites for each combination of plumbing materials (total of 45 sites), with an anticipated 10-15 sequential samples per site for metals per sampling event. Additional samples will be collected and analyzed to characterize the water quality and the sequential samples will be analyzed for Pb, Cu, Fe, Zn, and Al. An experienced plumber or researcher will be needed to map the plumbing at each site, field personnel will be needed to collect and ship samples, and a data manager will be needed to manage the data. If dissolved vs. total metals are desired in the analyses, an addition person with field filtration skills will be needed, in addition to the lab

supplies. If meters, brass or galvanized pipe are found to be a significant source of lead, those devices should be included in the pipe rigs.

5.4 Impact of Water Use/House Occupancy on Stability and Lead Release from Lead and Other Premise Piping.

There are a large number of unoccupied homes in Flint. Homes which have been unoccupied for an extended period of time can pose a greater risk to incoming residents due to the stagnation of water within the plumbing over an extended period of time which can destabilize the scales within the plumbing and release high lead levels into the water. If access can be facilitated by the City of Flint or other organizations involved with housing, sampling will be conducted at 10-20 vacant or recently occupied homes in conjunction with a flushing program to assess how long it takes for increased water usage to improve the effectiveness of the corrosion control treatment for these homes. Sequential sampling profiles would be done for metals as well as chlorine residuals for each home. Flushing for different times would be tested and evaluated with repeated profile sampling to see if there is any improvement in lowering lead levels with increased water use.

5.5 Protocol for Exposure Estimation Sampling for Health-Related Evaluations (Premise & Building Plumbing).

This protocol development would compare various potential options for sampling to estimate the cumulative metal exposure from the drinking water in premise plumbing or schools. Comparisons would be made with manual or automated proportional sampling, tap POU units that could log water use and be disassembled and digested for metal content, and random daytime sampling protocols. Different types of POU-suitable filtration apparatus would be tested to see if designs would permit quantitative separation of dissolved versus particulate lead and other metals. Support would be needed for setting up and operating test systems, analyzing virgin and exposed filter/device materials with accumulated metals, building and installation of proportional samplers or development of protocol for resident-collected samples, rapid turn-around Lead and other water analyses of test exposure water fed into experimental systems.

5.6 Risk communication on lead service lines

Request OEJ support/assistance for the development and dissemination of risk communication material on lead service lines, including the potential risk from physical disturbances to lead service lines and lead reservoirs in other pipes downstream of lead service lines.

5.7 Pipe analyses for long-term treatment assessment and mechanisms of lead and other metals release

Optimization of corrosion control treatment requires specialized knowledge on scale chemistry as well as specialized equipment and equipment operating skills. The timeline for activities related to evaluating the progress in optimizing corrosion control treatment following the transition to the KWA pipeline source will extend beyond the current fiscal year and likely well into FY 2017. The necessary resources and expertise must continue to be made available to the Task Force for the expected duration of the project in order to ensure a successful outcome

which would enable the City of Flint to simultaneously comply with all NPDWRs following the transition to the KWA pipeline.

6.0 Timeline

The proposed activities are contingent upon available funding. As such, it is not possible at this time to develop a meaningful timeline, with the exception of the activities in Section 2.0 and some of the activities in Section 3.0 which are discussed in those sections. Once funding is secured a detailed timeline will be developed that incorporates both funded and unfunded activities. A Task Force member will be identified as the lead person responsible for ensuring the completion of each activity or group of activities to ensure that the work is completed in accordance with the timeline.

Marshall, Marjorie

Subject: FW: Corrosion control 101 webinar - EPA
Location: Linda's office

Start: Mon 11/30/2015 12:30 PM
End: Mon 11/30/2015 2:30 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Gray, Jennifer (DHHS)

Here is the Webinar Appointment. Again - Meeting in Linda's Office..

Or I provided the connectivity information below – so you could catch some of it from your office.

-----Original Appointment-----
From: Harvey, Darrin D. (CDC/ONDIEH/NCEH) (CTR)
Sent: Monday, November 23, 2015 7:04 AM
To: Blake, Robert G. (CDC/ONDIEH/NCEH); Holler, James S. (Jim) (ATSDR/DTHHS/OD); Gillig, Richard (Rick) (ATSDR/DCHI/CB); Walker, Misha (Nikki) (CDC/ONDIEH/NCEH); Brown, Mary Jean (CDC/ONDIEH/NCEH); Merkle, Sarah (CDC/ONDIEH/NCEH); Sarisky, John (CDC/ONDIEH/NCEH); Johnson, Mark (EPA) (CDC epa.gov)
Subject: Corrosion Control in Drinking Water
When: Monday, November 30, 2015 1:30 PM-3:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Bldg. 106 RM 10A

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Forgot your dial-in PIN? | Help

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 02, 2015 8:38 AM
To: Kaplan, Robert
Subject: Discussion

Bob,
I'm wondering if you have about 30 minutes today for a one on one discussion.
Please let me know the best time to call.

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, December 02, 2015 9:28 AM
To: 'Sygo, Jim (DEQ)'
Cc: Martinez, Isidra
Subject: RE: Discussion

Of course. How about 4:00 p.m. your time?

- Bob

Cc: Isidra for schedule

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Wednesday, December 02, 2015 8:38 AM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: Discussion

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Please let me know the best time to call.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 02, 2015 11:49 AM
To: Kaplan, Robert
Cc: Martinez, Isidra
Subject: RE: Discussion

Okay

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Wednesday, December 02, 2015 10:28 AM
To: Sygo, Jim (DEQ)
Cc: Martinez, Isidra
Subject: RE: Discussion

Of course. How about 4:00 p.m. your time?

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Cc: Isidra for schedule

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Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, December 02, 2015 11:50 AM
To: 'Sygo, Jim (DEQ)'
Cc: Martinez, Isidra
Subject: RE: Discussion

Any chance for 1:00 pm your time? I'm free then as well.

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 02, 2015 3:49 PM
To: Kaplan, Robert
Subject: FW: Webinar
Attachments: FW: Corrosion control 101 webinar - EPA

Bob,
This may have been innocent enough, but thought I would provide you the detail that we had on this webinar. The meeting notice is attached.

From: Gohlke, Holly (DEQ)
Sent: Wednesday, December 02, 2015 4:19 PM
To: Shekter Smith, Liane (DEQ)
Cc: Philip, Kris (DEQ); Benzie, Richard (DEQ); Sygo, Jim (DEQ)
Subject: FW: Webinar

Hi Liane,
Per your email I am the person who "tried" to attend the "webinar".
I don't know if it was a "webinar" (or a discussion group) but I do know there was a slide presentation that was going to be delivered (I could see a PowerPoint in the background but couldn't make out the title or what it was about.
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I did not see any other quest names that I recognized.
Is it possible that the gentleman who spoke with me was John Sarisky, who is listed in the "TO:" on the original appointment from Darrin Harvey?

Below is the email I received from you on 11/25/15. Clicking on the attachment, I followed the "Join Skype Meeting" link and waited for the "presenter" to begin. Before the presentation came up, the Skype screen showed names of guests and a gentleman who was trying to get audio and other things set up started asking who was on the call and where they were from. I introduced myself and indicated that I was from the State of Michigan. I don't recall the gentleman's full name that was speaking, but I believe his name was John. He was asking for another guest to unmute and identify themselves (Porsche) and when Porsche didn't speak up, he then asked if the Michigan representatives could hang up from this meeting because "they" were planning on doing this with the Michigan group at a later time. I spoke to him to clarify that he wanted me to hang up, and he said yes, "thank you for understanding". Just before I hung up, I heard him say "If Porsche doesn't identify themselves they would have to change to a different call in number".

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, November 25, 2015 9:40 AM
To: Benzie, Richard (DEQ); Philip, Kris (DEQ); Gohlke, Holly (DEQ); Prysby, Mike (DEQ); Busch, Stephen (DEQ); Rosenthal, Adam (DEQ)
Subject: Webinar

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Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, December 02, 2015 3:57 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Webinar

Jim, thanks.

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It's of concern that anyone was asked to leave a public webinar for any reason. If it was EPA, please extend my apologies on behalf of EPA to the MDEQ employee, and accept my assurance that I follow up with whomever I need to make sure it doesn't happen again.

- Bob

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Sent: Wednesday, November 25, 2015 9:40 AM
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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 02, 2015 5:46 PM
To: Kaplan, Robert
Subject: Re: Webinar

My sense it's that it was a contractor

Sent from my iPhone

On Dec 2, 2015, at 4:57 PM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:

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Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, December 04, 2015 7:31 AM
To: Kaplan, Robert
Subject: Blood testing

This is what was reported out yesterday. Comparisons to pre Flint River levels were not included.

http://www.detroitnews.com/story/news/politics/2015/12/03/state-flint-residents-elevated-lead-levels/76739392/

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, December 04, 2015 7:37 AM
To: Kaplan, Robert
Subject: Blood Levels

Bob,
Separate story covered the rest.
Hurley study looked at samples over 2 consecutive summers which increased the numbers slightly.

http://www.freep.com/story/news/local/michigan/2015/12/03/flint-kids-lead-levels/76746474/

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, December 04, 2015 2:18 PM
To: 'Sygo, Jim (DEQ)'
Subject: Attached -- Task Force Comments on Residential Sampling Protocol
Attachments: Task Force Comments on MDHHS Residential Sampling Protocol 12-4-15.pdf

Jim,

Thanks for giving the Task Force the opportunity to comment on the Residential Sampling Protocol. I've attached EPA's comments.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Flint Drinking Water Task Force (FTF 15-4)

Task Force Comments on Michigan Department of Health and Human Services' Draft Protocol for Collecting Residential Drinking Water Samples for Lead Analysis.

EPA received the draft of Michigan DHHS's draft "Protocol for Collecting Residential Drinking Water Samples for Lead Analysis Flint's Residential" for comment from Jim Sygo, MDEQ, on November 18, 2015. Below are comments from EPA's Flint Safe Drinking Water Task Force.

Specific Comments

1. The document needs to be clear on the purpose for this sampling. Is the sampling trying to determine the contribution of lead in drinking water to elevated blood lead (EBL) levels? Is the sampling to determine the current exposure to lead in drinking water? In "Step 2 – Identify and Label the Sample Faucets", there is the instruction "If a temporary in-line filter is installed on the faucet, use the by-pass lever to collect unfiltered water samples. A whole house filter does not preclude sampling, as this is a permanent filter and representative of actual exposure."

If the sampling is to try to determine the contribution of lead in drinking water to an EBL level result, the resident needs to be asked whether a tap filter was in use and maintained during the period of exposure leading to the EBL result. This will determine whether the tap filter should be by-passed. There needs to be comprehensive characterization of both the actual ingested water for a given monitored child, and also in parallel, an assessment of the potential from the unfiltered water. Filters have finite lifetimes before replacement, and we don't know when they are exhausted and how that impacts the exposure of the individual.

If the sampling is to determine current exposure, then the tap filter should not be by-passed. There are other complexities with determining current exposure with the use of a tap filter. The investigators will need to question the residents about how often they are using the filter and how often they are using unfiltered water from that or other untreated taps in the house. There might even be a need to do a follow-up smaller set of samples taken through the filter to make sure it has been maintained and is still removing lead.

2. We suggest adding the following language to the last sentence of the introductory paragraph to make it clear that the interior plumbing and the service line are being evaluated for lead contributions: "The results will be used to evaluate human exposure to lead in household drinking water and to identify all plumbing components from the home to the water main that are contributing lead to household drinking water."

3. The drinking water samples from the kitchen faucet, including both the two 125-ml first-draw samples and the sequential 1-liter samples, should be collected **before** any small volume samples are taken from bathrooms. The two 125-ml samples from the bathroom faucets is water sitting in the faucet and a short segment of pipe under the sink. Taking the kitchen samples first shouldn't

affect this water. On the other hand, taking the bathroom samples first will draw water from the interior plumbing/service line, especially if multiple bathrooms are sampled.

4. The protocol indicates ten large volume sequential samples will be taken from the kitchen cold water faucet. Please be aware that the number of 1-liter samples to capture water from the sample tap to the water main will be different depending on the distance from the tap to the main and on the diameter of the pipes. Additional samples may need to be taken in certain situations, e.g., if the kitchen tap is at the back of the house; the water main is across the street from the house. A way to estimate the number of samples needed is: Estimate the distance from the front of the house to the water main. Divide that distance by 15 and round up to the nearest whole number. Add 4 to the result (for internal plumbing).

5. Wide-mouth bottles should be used for the 1-liter samples to allow the samples to be collected by opening the cold water faucet gently but fully in order to be consistent with how the resident would fill a glass or pot with water.

6. In the section "Before the EBL Inspection" where information is being gathered about the house, we suggest also identifying/photographing any street work that has been done in front of the house (i.e., physical disturbances). This can be road work, water main work, other utility work, etc.

7. In "Step 3 – Collect the Small Volume Samples", the instructions state do not remove the aerator if there is one, but make a note if one is present. We suggest checking the aerator for particles after the water samples have been taken.

8. In "Step 4 – Collect the Large Volume Samples: Sample collection", We suggest the following language for #1: "Place the A1 bottle under the faucet, open the cold water faucet gently but fully ~~to produce a moderate, steady stream~~ and fill the first bottle to the appropriate level. Immediately fill bottles A2 to A10 consecutively without a break in the stream (do not turn off the faucet between bottles and do not allow water to run down the drain between the bottles).

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, December 04, 2015 3:14 PM
To: Kaplan, Robert
Subject: RE: Attached -- Task Force Comments on Residential Sampling Protocol

Thanks Bob. I'll pass this along to HHS.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Friday, December 04, 2015 3:18 PM
To: Sygo, Jim (DEQ)
Subject: Attached -- Task Force Comments on Residential Sampling Protocol

Jim,

Thanks for giving the Task Force the opportunity to comment on the Residential Sampling Protocol. I've attached EPA's comments.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, December 04, 2015 3:53 PM
To: Kaplan, Robert
Subject: LCR Compliance Monitoring Instructions
Attachments: Resident Sampling Instructions-12-4-2015.docx

Bob.
This is the revised instructions for Compliance Monitoring under LCR that Michigan is proposing to use this January. Comments are welcomed.
This replaces the separate document that was proposed by the City of Flint. It does incorporate the recommendations of the Technical Advisory Committee form November.

DRINKING WATER LEAD AND COPPER SAMPLING INSTRUCTIONS

Dear Resident:

Thank you for helping to monitor for lead and copper in your drinking water. This sampling is required by the federal and state Safe Drinking Water Acts, and is being accomplished with the cooperation of homeowners, residents, and water system customers.

It is important that you follow these instructions so we obtain an accurate measurement of the lead and copper in your drinking water. This sample should represent the water you would typically drink and the faucet from where you drink the water. To best accomplish this goal, select a faucet for sampling that was used the day before you intend to sample. Call your water supply if you have questions.

1. Water must sit idle in the pipes for an extended length of time before sampling. Therefore, do not use any water in the house for at least 6 hours before sampling. The best times to sample are early morning or after returning from work.

2. Select an unfiltered/untreated faucet in the **KITCHEN** or **BATHROOM** that is commonly used for drinking. **DO NOT** sample from a laundry sink or a hose spigot as these samples cannot be used for compliance. **DO NOT** use a faucet that has a filter attached to it unless you bypass the filter. **DO NOT** use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device.

3. Place the open sample bottle below the faucet and gently open the **COLD** water tap. If you have a single handle faucet, turn it fully to the **COLD** side. Fill the sample bottle to the neck with the "first draw" of **COLD** water.

4. Tightly cap the sample bottle and place in the sample kit provided. Review the sample kit label to ensure all information contained on the label is complete and correct.

5. Answer the questions on the back of this form and sign the form.

6. Attach this form to the bottle and leave it outside your front door for pick-up.

7. Thank you again for your help. We will send you your individual results within 30 days of receiving them from the laboratory. A summary of information on this year's lead and copper monitoring will be printed in the annual water quality report that will be made available by July 1 of next year. Contact your water supply if you have questions.

If you have questions call:
Water Supply: _____

Manager or
Water Operator: _____

Phone: _____

Or Contact:
Michigan Department of Environmental Quality

DEQ Contact: _____

Phone: _____

TO BE COMPLETED BY RESIDENT/CUSTOMER

A. Which faucet did you use to fill the bottle?

☐ Kitchen ☐ Main bathroom ☐ Other

If OTHER, please describe: _____

_____

B. When was the faucet last used before sampling?

Date _____ TIME _____ AM/PM

Note: If the faucet has been idle more than 24 hours, we might not analyze your sample or be able to use your sample for compliance purposes.

C. When did you fill the bottle?

DATE _____ TIME _____ AM/PM

D. Is there a faucet mount filter? ☐ YES ☐ NO

If YES, was it bypassed? ☐ YES ☐ NO

E. Is this faucet connected to a home treatment device such as a water softener, a reverse osmosis unit, an iron removal device OR is any kind of additive used in the home? ☐ YES ☐ NO

If YES, please describe: _____

_____

Note: If you have a home treatment device OR any kind of additive is used, it is possible we might not analyze your sample or be able to use your sample for compliance purposes.

F. If any plumbing repairs or replacement has been done in the home since the previous sampling event, please note this information here:

If YES, please describe: _____

_____

I have read the Drinking Water Lead and Copper Sampling Instructions and have taken a tap sample in accordance with these directions.

_____

Signature

Kaplan, Robert

From: Kaplan, Robert
Sent: Friday, December 04, 2015 4:59 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: LCR Compliance Monitoring Instructions

Thanks, Jim. I will pass it along to the Task Force Members. – Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Friday, December 04, 2015 3:53 PM
> **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> **Subject:** LCR Compliance Monitoring Instructions
>
> Bob.
> This is the revised instructions for Compliance Monitoring under LCR that Michigan is proposing to use this January.
> Comments are welcomed.
> This replaces the separate document that was proposed by the City of Flint. It does incorporate the recommendations of the Technical Advisory Committee form November.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Tuesday, December 08, 2015 11:46 AM
To: Kaplan, Robert
Subject: Brownell Academy Report and data
Attachments: BrownellAcademy_Report.pdf; Brownell Spreadsheet.pdf

Bob,
Attached is the report on the Brownell Academy.
Should be goin onto the web site tomorrow.

BACKGROUND INFORMATION

On Friday, October 30, 2015, the Department of Licensing and Regulatory Affairs (DLARA) and the Department of Environmental Quality (DEQ) conducted an assessment of the plumbing system at Brownell STEM Academy to gain a comprehensive understanding of how water moves through the building and what types of plumbing materials are used. The assessment identified the following potential sources of lead leaching into drinking water:

- Lead solder joints on copper piping
- Brass valves and brass fittings
- Brass components in fixtures
- Galvanized piping

The assessment also identified a total of 23 faucets or fountains that provide water for drinking, cooking and/or food preparation. The team developed a sequence for sampling the faucets/fountains based on how water travels through the school building.

On Saturday, October 31, 2015, the DEQ and the DLARA completed sampling of the 23 faucets/fountains in the Brownell STEM Academy school building in the order determined by the plumbing assessment from the previous day, following a stagnation period of over 12 hours. At each of the 23 faucets/fountains identified, staff collected four samples. Two initial, 125-milliliter samples (P1 and P2), were collected immediately after turning on the tap. The water was then flushed for 30 seconds and a third, 125-milliliter sample (F01) was collected. Finally, the water was flushed for another two minutes, and the fourth 125-milliliter sample (F02) was collected. These samples were used to determine the impact of any lead sources in and around each specific faucet/fountain and its connecting plumbing.

The DEQ and the DLARA then completed consecutive sampling at three of the 23 faucets/fountains in the Brownell STEM Academy school building. This consecutive sampling was used to determine the impact of any lead sources located deep in the supply plumbing of the school building. The three sites included one site near the building service line, one site near the plumbing mid-point, and one site at the far end of the plumbing system. At each of these three sites, staff collected ten, 1-liter samples. The ten samples were collected immediately after turning on the tap, and consecutively, without any flushing time in between.

WATER SERVICE INFORMATION

A four-inch diameter cast iron water service line enters the main school building in the mechanical room located in the middle of the building. Piping in the boiler room immediately transitions into galvanized metal piping and then into copper piping with lead solder joints for cold water lines. Two separate copper cold water supply lines exit the mechanical room. One through the north wall in the west corner appears to serve fixtures in the north end of the main wing of the school building. A second line exits the south wall and appears to serve fixtures in the south end of the main wing, and then continues over and serves fixtures in the west wing of the school building. Copper piping with lead solder joints branches off of the copper supply lines. Hot water is distributed in continuous loops that feed from and return to a central water heater in the mechanical room. Hot water piping material, where exposed, was copper piping with lead solder joints. Brass valves were seen throughout the building.

BROWNELL STEM ACADEMY

Outlet Sampling and Plumbing Assessment Recommendations

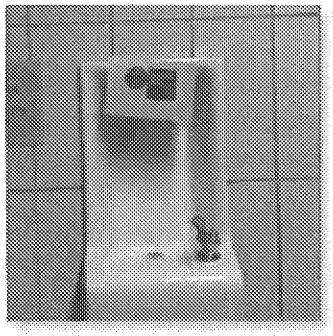
6302 Oxley Drive, Flint, Michigan 48504

DEQ

Outlets With Lead Levels Greater Than 15 Parts per Billion

The DEQ recommends school facilities take action if samples from any drinking water outlets show lead levels greater than 15 parts per billion. Based on the sampling conducted at 23 faucets/fountains on October 31, 2015, the following 12 drinking water outlets had lead water level results greater than 15 parts per billion. Each of these 12 outlets is listed below with its sample results, including a description of the potential source(s) of lead, and recommended actions for the school to take.

Outlet: Bubbler Drinking Fountain (DW001)

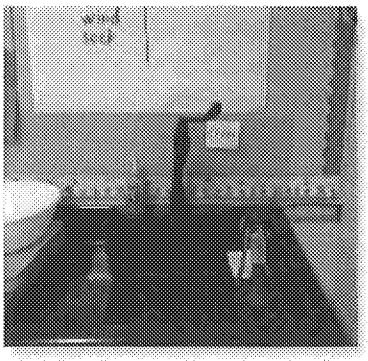


Location: North Hallway, across from Classroom 12
Results: P1=64 parts per billion, P2=4 parts per billion
F01=2 parts per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Laboratory Sink Faucet, Right (CF004)



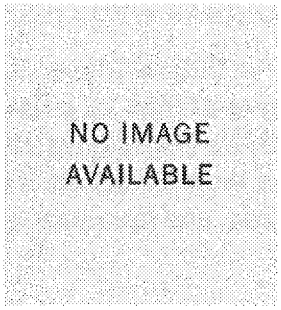
Location: Classroom 17, west wall
Results: P1=56 parts per billion, P2=29 parts per billion,
F01=7 parts per billion, F02=3 parts per billion

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. This faucet appears to be constructed of coated brass. Connecting plumbing for this faucet was not accessible, but should be checked for additional lead containing components, including brass fittings and a brass valve.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Laboratory Sink Faucet, Left (CF005)

Location: Classroom 17, west wall
Results: P1=31 parts per billion, P2=6 parts per billion, F01=2 parts per billion, F02=1 part per billion

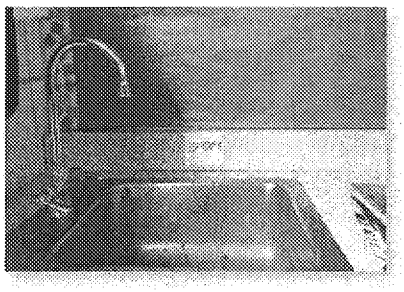


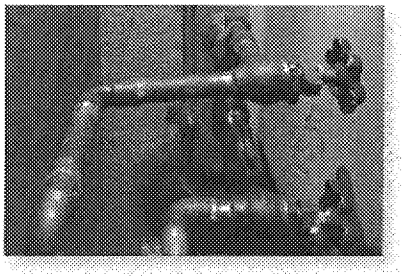
These results suggest the highest contribution of lead may be from the faucet itself. This faucet appears to be constructed of coated brass. Connecting plumbing for this faucet was not accessible, but should be checked for additional lead containing components, including brass fittings and a brass valve.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet, Left (CF007)

Location: Classroom 26, south wall
Results: P1=164 parts per billion, P2=166 parts per billion, F01=15 parts per billion, F02=1 part per billion





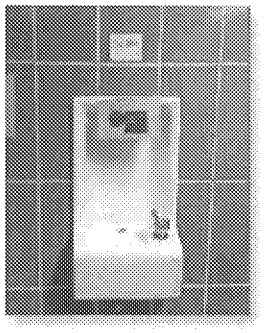
These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Hot and cold water lines connect to this faucet with a brass mixer fitting under the sink. Connecting plumbing in the cabinet under the sink is copper piping with lead solder and contains additional brass components and brass shutoff valves.

Copper results for samples P1 and P2 at this location were also at levels above which the DEQ recommends school facilities take action. Copper results suggest these same brass components are contributing to this condition.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead and copper exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

This faucet also has an aerator/screen at the outlet. If the faucet is not replaced, the aerator/screen should be removed, inspected for particulate accumulations, scrubbed clean, and reinstalled. If particulates are found, the aerator/screen should be periodically checked and cleaned.

Outlet: Bubbler Drinking Fountain, Right (DW008)



Location: South Hallway, across from Classroom 26
Results: P1=46 parts per billion, P2=11 parts per billion,
F01=4 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

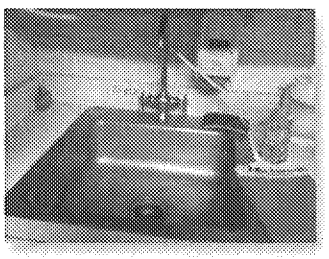
Outlet: Bubbler Drinking Fountain, Left (DW009)

Location: South Hallway, across from Classroom 26
Results: P1=23 parts per billion, P2=7 parts per billion,
F01=3 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass, has a brass connection on the underside of the unit, and a brass operating valve on the side of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Sink Faucet (CF010)



Location: Room 27 Lounge, north wall
Results: P1=25 parts per billion, P2=34 parts per billion,
F01=2 parts per billion, F02=non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass, and has a brass connection on the underside of the sink. Connecting plumbing in the cabinet under the sink includes brass connectors and brass shut off valves.

Replacement of this faucet and its connection plumbing with lead free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

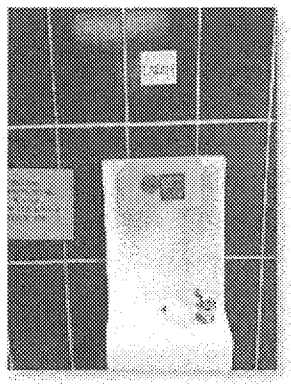
Outlet: Bubbler Drinking Fountain, Left (DW013)

Location: West Wing South Hallway, between Classrooms 1 and 2
Results: P1=27 parts per billion, P2=15 parts per billion,
F01=8 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Right (DW014)



Location: West Wing South Hallway, between Classrooms 1 and 2
Results: P1=16 parts per billion, P2=3 parts per billion,
F01=2 parts per billion, F02=1 part per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

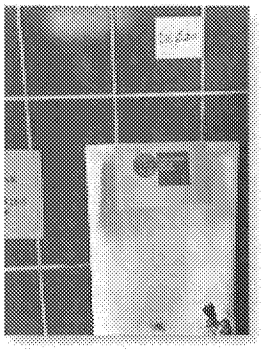
Outlet: Sink Faucet (KC019)

Location: Classroom 4, east wall
Results: P1=16 parts per billion, P2=10 parts per billion,
F01=non-detect, F02=non-detect

These results suggest the highest contribution of lead may be from the faucet and its connecting plumbing. The base of this faucet is chrome plated brass. Connecting plumbing for this faucet should be checked for additional lead containing components, including brass fittings and brass valves.

Replacement of this faucet and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Right (DW020)



Location: West Wing North Hallway, between Classrooms 6 and 7
Results: P1=33 parts per billion, P2=15 parts per billion,
F01=20 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlet: Bubbler Drinking Fountain, Left (DW021)

Location: West Wing North Hallway, between Classrooms 6 and 7
Results: P1=38 parts per billion, P2=27 parts per billion,
F01=2 parts per billion, F02=2 parts per billion

These results suggest the highest contribution of lead may be from the bubbler itself. This bubbler fixture is made of chrome plated brass with a brass connection on the underside of the unit. The connection piping to the unit also contains some brass components, including brass fittings and a brass valve.

Replacement of this bubbler tap and its connection plumbing with lead-free materials will significantly reduce lead exposure at this location. If replacement is not currently feasible, sample results indicate that flushing this tap for three minutes following periods of stagnation is likely to reduce lead concentrations and lead exposure.

Outlets With Lead Levels 15 Parts per Billion or Less

While the remaining 11 outlets showed sample results to be at levels requiring no further action, several recommendations have been identified.

The fourth sample (F02) at all 23 outlets following approximately three minutes of use and flushing at a reduced flow resulted in reduced lead concentrations of 3 parts per billion or less. This indicates that flushing of all taps used for drinking, cooking, and/or food preparation for four minutes following periods of stagnation will further reduce lead exposure. It is recommended that a flushing operational procedure be developed for use by staff responsible for plumbing operations and maintenance with emphasis on flushing after weekends and holidays.

Five of these 11 outlets are comprised of similar materials as the outlets listed above and could potentially experience higher lead levels under extended periods of stagnation. These faucets/fountains include:

- Bubbler Drinking Fountain Unit in North Hallway, across from Classroom 12 (DW002)
- Chrome Plated Brass Base Faucets in Classroom 15 (CF003), Classroom 26 (CF006), Classroom 6 (CF022), and Classroom 7 (CF023)

Replacement of these fixtures with lead-free materials is also recommended.

The remaining six outlets showed sample results of 15 parts per billion or less, requiring no further action or additional recommendations. These faucets/fountains include:

- Kitchen Faucets in the Community Room (CF012), Classroom 2 (KC017), and two in Classroom 1 (KC015 and KC016).
- Integrated Bubbler Faucet in the Classroom 4 restroom (CF018)
- Water Cooler in the hallway east of the Gym (WC011)

Consecutive Sampling Results and Building Plumbing Recommendations

The consecutive samples taken on October 31, 2015, at three sites in the Brownell STEM Academy school building provide additional confirmation that the highest contribution of lead appears to be from the individual faucet/fountains and not from the larger diameter supply plumbing within the school building. However, results from Classroom 17 also suggest that the copper supply line with lead solder joints serving the north hallway in the main wing may contain more stagnant water due to the limited number of fixtures served by this line and their lack of use. A flushing operational procedure may further reduce lead contributions from this supply line caused by stagnant conditions related to its use. Results of the consecutive sample monitoring are listed in the table below.

Consecutive Sample No.	1	2	3	4	5	6	7	8	9	10
LOCATION	LEAD RESULT (PARTS PER BILLION; ND = NOT-DETECTED)									
Classroom 17 Lab Sink Faucet (CF004)	10	3	3	3	2	2	2	2	2	2
Community Room Sink Faucet (CF012)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Classroom 7 Sink Faucet (CF023)	2	ND	ND	ND	ND	ND	ND	ND	ND	ND

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.000	Copper	0.06	CF012	P1	First Primary draw of 125 milliliters
Lead	0.014	Copper	0.13	CF012	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	CF012	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF012	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.011	Copper	0.56	WC011-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.014	Copper	0.67	WC011-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.014	Copper	0.39	WC011-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.06	WC011-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	0.42	DW008-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.011	Copper	0.10	DW008-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.00	DW008-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW008-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.010	Copper	0.17	CF004 - RM #17	CA1	First Sequential Sample
Lead	0.003	Copper	0.17	CF004 - RM #17	CA2	Second Sequential Sample
Lead	0.003	Copper	0.18	CF004 - RM #17	CA3	Third Sequential Sample
Lead	0.003	Copper	0.19	CF004 - RM #17	CA4	Forth Sequential Sample
Lead	0.002	Copper	0.20	CF004 - RM #17	CA5	Fifth Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	CA6	Sixth Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	CA7	Seventh Sequential Sample
Lead	0.002	Copper	0.19	CF004 - RM #17	CA8	Eigth Sequential Sample
Lead	0.002	Copper	0.18	CF004 - RM #17	CA9	Ninth Sequential Sample
Lead	0.002	Copper	0.17	CF004 - RM #17	CA10	Tenth Sequential Sample
Lead	0.002	Copper	0.00	CF012 -	CB1	First Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB2	Second Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB3	Third Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB4	Forth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB5	Fifth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB6	Sixth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB7	Seventh Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB8	Eigth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB9	Ninth Sequential Sample
Lead	0.000	Copper	0.00	CF012	CB10	Tenth Sequential Sample
Lead	0.002	Copper	0.00	CF023	CC1	First Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC2	Second Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC3	Third Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC4	Forth Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC5	Fifth Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC6	Sixth Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC7	Seventh Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC8	Eigth Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC9	Ninth Sequential Sample
Lead	0.000	Copper	0.00	CF023	CC10	Tenth Sequential Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.
Results in RED exceed 15 ppb for lead or 1.3 ppm for Copper
1 ppb = 0.001 mg/L

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.022	Copper	0.14	DW013-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.015	Copper	0.13	DW013-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.008	Copper	0.09	DW013-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW013-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.005	Copper	0.10	DW021-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW021-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW021-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW021-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.008	Copper	0.00	CF023-RM #7	P1	First Primary draw of 125 milliliters
Lead	0.012	Copper	0.15	CF023-RM #7	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.06	CF023-RM #7	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF023-RM #7	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.015	Copper	0.08	DW014-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.003	Copper	0.00	DW014-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW014-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW014-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.026	Copper	0.18	KC019-RM #4	P1	First Primary draw of 125 milliliters
Lead	0.010	Copper	0.28	KC019-RM #4	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	KC019-RM #4	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC019-RM #4	FD2	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.025	Copper	0.16	DW020-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.015	Copper	0.12	DW020-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	DW020-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW020-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.012	Copper	0.14	DW002-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.08	DW002-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.00	DW002-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.00	DW002-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.011	Copper	0.20	CF022-RM #6	P1	First Primary draw of 125 milliliters
Lead	0.006	Copper	0.22	CF022-RM #6	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	CF022-RM #6	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.07	CF022-RM #6	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.009	Copper	0.07	CF006-RM 26	P1	First Primary draw of 125 milliliters
Lead	0.010	Copper	0.15	CF006-RM 26	P2	Second Primary draw of 125 milliliters
Lead	0.004	Copper	0.16	CF006-RM 26	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF006-RM 26	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.036	Copper	0.21	CF004-RM 17	P1	First Primary draw of 125 milliliters
Lead	0.009	Copper	0.14	CF004-RM 17	P2	Second Primary draw of 125 milliliters
Lead	0.007	Copper	0.16	CF004-RM 17	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.003	Copper	0.17	CF004-RM 17	F02	Flush Sample taken 2 minutes after First Flush Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.
Results in RED exceed 15 ppb for lead or 1.3 ppm for Copper
1 ppb = 0.001 mg/L

Brownell STEM Academy
6302 Oxley Drive
Flint, Michigan 48504

ANALYTE	RESULT (mg/L)	ANALYTE	RESULT (mg/L)	Sample Description	Site Code	Site Code Description
Lead	0.011	Copper	0.14	KC016-RM-#1	P1	First Primary draw of 125 milliliters
Lead	0.003	Copper	0.14	KC016-RM-#1	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.05	KC016-RM-#1	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC016-RM-#1	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.013	Copper	0.18	KC017-RM #2	P1	First Primary draw of 125 milliliters
Lead	0.008	Copper	0.18	KC017-RM #2	P2	Second Primary draw of 125 milliliters
Lead	0.001	Copper	0.00	KC017-RM #2	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	KC017-RM #2	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.010	Copper	0.09	CF018-RM #4	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.11	CF018-RM #4	P2	Second Primary draw of 125 milliliters
Lead	0.000	Copper	0.00	CF018-RM #4	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF018-RM #4	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.007	Copper	0.13	KC015-RM #1	P1	First Primary draw of 125 milliliters
Lead	0.002	Copper	0.27	KC015-RM #1	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	KC015-RM #1	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.07	KC015-RM #1	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	0.08	CF005-RM 17	P1	First Primary draw of 125 milliliters
Lead	0.006	Copper	0.07	CF005-RM 17	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.06	CF005-RM 17	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.06	CF005-RM 17	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	0.11	DW001-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.004	Copper	0.09	DW001-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.09	DW001-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	DW001-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	0.33	DW009-DRINKING	P1	First Primary draw of 125 milliliters
Lead	0.007	Copper	0.09	DW009-DRINKING	P2	Second Primary draw of 125 milliliters
Lead	0.003	Copper	0.00	DW009-DRINKING	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.002	Copper	0.00	DW009-DRINKING	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	0.19	CF010-RM 27	P1	First Primary draw of 125 milliliters
Lead	[redacted]	Copper	0.16	CF010-RM 27	P2	Second Primary draw of 125 milliliters
Lead	0.002	Copper	0.00	CF010-RM 27	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF010-RM 27	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	[redacted]	Copper	[redacted]	CF007-RM 26	P1	First Primary draw of 125 milliliters
Lead	[redacted]	Copper	[redacted]	CF007-RM 26	P2	Second Primary draw of 125 milliliters
Lead	0.015	Copper	0.78	CF007-RM 26	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.001	Copper	0.06	CF007-RM 26	F02	Flush Sample taken 2 minutes after First Flush Sample
Lead	0.007	Copper	0.14	CF003-RM 15	P1	First Primary draw of 125 milliliters
Lead	0.011	Copper	0.11	CF003-RM 15	P2	Second Primary draw of 125 milliliters
Lead	0.001	Copper	0.09	CF003-RM 15	F01	Flush Sample taken 30 Seconds after Second Primary Draw
Lead	0.000	Copper	0.00	CF003-RM 15	F02	Flush Sample taken 2 minutes after First Flush Sample

Note: Results of "Not Detected" have been converted to a numerical value of zero to allow for ease of sorting.
Results in RED exceed 15 ppb for lead or 1.3 ppm for Copper
1 ppb = 0.001 mg/L

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 09, 2015 2:14 PM
To: Kaplan, Robert
Subject: Fwd: Phosphate Feed System

FYI

Sent from my iPhone

Begin forwarded message:

> **From:** "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>
> **Date:** December 9, 2015 at 3:07:03 PM EST
> **To:** "Krisztian, George (DEQ)" <krisztiang@michigan.gov>, "Shekter Smith, Liane (DEQ)" <SHEKTERL@michigan.gov>, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
> **Subject: FW: Phosphate Feed System**
>
> Below is an update on the status of the corrosion control treatment system at the Flint WTP.
>
> Michael Prysby, P.E.
> District Engineer
> Office of Drinking Water and Municipal Assistance
> 517 290-8817
>
> **From:** Brent Wright [mailto:bwright@cityofflint.com]
> **Sent:** Wednesday, December 09, 2015 2:37 PM
> **To:** Prysby, Mike (DEQ)
> **Cc:** Rosenthal, Adam (DEQ); Busch, Stephen (DEQ); Michael Glasgow; Natasha Henderson
> **Subject:** Phosphate Feed System
>
> Mike,
>
> As of 1:45pm today the Phosphate feed system at the Water Plant is up and running. The feed rate is set at 2.5mg/l as PO4-3. If you have any questions please give me a call.
>
> Thank you.
>
> --
> **Brent Wright**
> **Water Plant Supervisor**
> **City of Flint**
> **4500 N. Dort Hwy.**
> **Flint, MI. 48505**

Ph: 810.787.6537 ext. 3510
Fx: 810.787.3710

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, December 09, 2015 2:53 PM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Phosphate Feed System

Jim,

Hurray! Thanks for letting me know. That is great news.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Wednesday, December 09, 2015 2:14 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: Fwd: Phosphate Feed System

FYI

Sent from my iPhone

Begin forwarded message:

From: "Prysby, Mike (DEQ)" <PRYSBYM@michigan.gov>
Date: December 9, 2015 at 3:07:03 PM EST
To: "Krisztian, George (DEQ)" <krisztiang@michigan.gov>, "Shekter Smith, Liane (DEQ)" <SHEKTERL@michigan.gov>, "Sygo, Jim (DEQ)" <SygoJ@michigan.gov>
Subject: FW: Phosphate Feed System

Below is an update on the status of the corrosion control treatment system at the Flint WTP.

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 290-8817

From: Brent Wright [mailto:bwright@cityofflint.com]
Sent: Wednesday, December 09, 2015 2:37 PM
To: Prysby, Mike (DEQ)
Cc: Rosenthal, Adam (DEQ); Busch, Stephen (DEQ); Michael Glasgow; Natasha Henderson
Subject: Phosphate Feed System

Mike,

As of 1:45pm today the Phosphate feed system at the Water Plant is up and running. The feed rate is set at 2.5mg/l as PO4-3. If you have any questions please give me a call.

Thank you.

--
Brent Wright
Water Plant Supervisor
City of Flint
4500 N. Dort Hwy.
Flint, MI. 48505
Ph: 810.787.6537 ext. 3510
Fx: 810.787.3710

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Thursday, December 10, 2015 4:16 PM
To: Kaplan, Robert
Subject: Accepted: Flint Call - Conference Code / Ex.6 Access Code: Conference Code / Ex.6

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Friday, December 18, 2015 9:30 AM
To: Kaplan, Robert
Subject: FW: Flint DWRF Project Plan requirements

Keeping Flint informed of application dates for Drinking Water Revolving Loan Fund.

From: Butler, Sonya (DEQ)
Sent: Thursday, December 17, 2015 3:15 PM
To: Sygo, Jim (DEQ)
Cc: Shekter Smith, Liane (DEQ)
Subject: FW: Flint DWRF Project Plan requirements

FYI

From: Pocan, Eric (DEQ)
Sent: Thursday, December 17, 2015 2:46 PM
To: Natasha Henderson (nhenderson@cityofflint.com)
Cc: Butler, Sonya (DEQ); Fitzner, Wendy (DEQ); Green, Kelly (DEQ)
Subject: Flint DWRF Project Plan requirements

Natasha,

I have been informed that the City of Flint is planning on submitting a Drinking Water Revolving Fund Project Plan by May 1, 2016 for ranking on the fiscal year 2017 project priority list. I will be the project manager for Flint and just wanted to provide you with an estimated timeline to prepare a project plan for submittal. The following is an estimated timeline that should be followed to have a plan ready by the May 1st deadline date:

February 1, 2016- Submit a draft project plan to the MDEQ for comments (Please see our Project Plan Preparation guidance on what information should be included in a project plan)

March 1, 2016- Incorporate MDEQ comments into the draft project plan

March 9, 2016- **Provide a mandatory 30-day notice** for the public hearing and have the draft project plan available for the public to view

April 9, 2016-Incorporate public comments into draft project plan prior to the public hearing. Make final project plan available to the public prior to the public hearing

April 11, 2016- Hold public hearing on project plan. (The hearing can take place after 30 days of notice. If the hearing is held on the 30th day the plan will be rejected)

April 25, 2016- Resolution of Project Plan Adoption (This can also be done on the same day as the hearing but the resolution should be voted on only after the project presentation and comments from the public have concluded) I used the April 11 and April 25 dates to coincide with the scheduled Flint city council meetings listed on your website.

April 29, 2016- Submit final project plan to the MDEQ (Reminder that May 1, 2016 in on a Sunday)

Bolded items are required not estimated. These are program requirements and deadline dates.

Please feel free to contact me with any questions you have on this process and pass this timeline on to your consulting firm. We have guidance documents located on our webpage that will outline how to put together a successful project plan. I look forward to working with you in the future.

Eric Pocan, Project Manager
Department of Environmental Quality
Office of Drinking Water and Municipal Assistance
Revolving Loan Section
517-284-5416 Office


Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 30, 2015 9:27 AM
To: Kaplan, Robert
Subject: Lead/Copper Compliance Sampling Instrutions

Bob,

EPA indicated verbally that they approved our revised Lead and Copper sampling instructions, we finalized the document and posted it on our website:

http://www.michigan.gov/documents/deq/Resident_Sampling_Instructions-12-11-2015_508290_7.pdf

We are, however, still waiting for EPA to provide us with an e-mail documenting that we addressed all of EPAs concerns and that they have approved/signed off on the revised document.

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, December 30, 2015 9:54 AM
To: 'Sygo, Jim (DEQ)'
Subject: RE: Lead/Copper Compliance Sampling Instrutions

Thanks.

Do you have time for a quick check-in call today? - Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Wednesday, December 30, 2015 9:27 AM
> **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> **Subject:** Lead/Copper Compliance Sampling Instrutions
>
> Bob,
>
> EPA indicated verbally that they approved our revised Lead and Copper sampling instructions, we finalized the document and posted it on our website:
>
> http://www.michigan.gov/documents/deq/Resident_Sampling_Instructions-12-11-2015_508290_7.pdf
>
> We are, however, still waiting for EPA to provide us with an e-mail documenting that we addressed all of EPAs concerns and that they have approved/signed off on the revised document.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, December 30, 2015 10:02 AM
To: Kaplan, Robert
Subject: Re: Lead/Copper Compliance Sampling Instrutions

I'm on the road for the next hour or so.
If you want to call me use my cell
Personal Phone / Ex. 6

Sent from my iPhone

On Dec 30, 2015, at 10:54 AM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:

> Thanks.
>
> Do you have time for a quick check-in call today? - Bob
>
> Robert Kaplan
> Deputy Regional Administrator
> U.S. EPA Region 5
> Phone: (312) 886-1499
> Cell: (312) 515-9827
> Fax: (312) 692-2075
>
> > **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> > **Sent:** Wednesday, December 30, 2015 9:27 AM
> > **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> > **Subject:** Lead/Copper Compliance Sampling Instrutions
> >
> > Bob,
> >
> > EPA indicated verbally that they approved our revised Lead and Copper sampling instructions, we finalized the document and posted it on our website:
> >
> > http://www.michigan.gov/documents/deq/Resident_Sampling_Instructions-12-11-2015_508290_7.pdf
> >
> > We are, however, still waiting for EPA to provide us with an e-mail documenting that we addressed all of EPAs concerns and that they have approved/signed off on the revised document.

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Thursday, January 07, 2016 2:02 PM
To: Kaplan, Robert
Subject: Call

I think it would be helpful to have a call next week to determine where we are on Flint and what is expected. To my knowledge we have not received the incident action plan you identified in your last note.
As a reminder DEQ would like EPAs written acknowledgement that the revised L/C Compliance Monitoring form is good to send out and utilize.

Thanks Bob.

Sent from my iPhone

Kaplan, Robert

From: Kaplan, Robert
Sent: Thursday, January 07, 2016 4:04 PM
To: 'Sygo, Jim (DEQ)'
Subject: Call and Resident Sampling Instructions
Attachments: Resident Sampling Instructions-12-4-2015.pdf

Hello Jim,

Yes, I think it would be helpful to set a call with the Task Force. We are working on setting up a time now.

You asked about the LCR Sampling Instructions. I thought I had send these earlier, but apparently failed to do so. I am enclosing the revised sampling instructions now.

The sampling instructions address the Task Force comments, and put the instructions into an-easy-to-understand form. As you begin to use the instructions in Flint and elsewhere, we would be interested in any feedback you may get about the clarity and utility of the instructions. Finally, while this does not change the instructions to residents, we want to remind the you of the Task Force's earlier comment that you should switch to wide mouth sample bottles to accommodate sample collection at normal faucet flow rate.

Thanks again,

-- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

-----Original Message-----
From: Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
Sent: Thursday, January 07, 2016 2:02 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>
Subject: Call

I think it would be helpful to have a call next week to determine where we are on Flint and what is expected. To my knowledge we have not received the incident action plan you identified in your last note.
As a reminder DEQ would like EPAs written acknowledgement that the revised L/C Compliance Monitoring form is good to send out and utilize.

Thanks Bob.

Sent from my iPhone

DRINKING WATER LEAD AND COPPER SAMPLING INSTRUCTIONS

Dear Resident:

Thank you for helping to monitor for lead and copper in your drinking water. This sampling is required by the federal and state Safe Drinking Water Acts, and is being accomplished with the cooperation of homeowners, residents, and water system customers.

It is important that you follow these instructions so we obtain an accurate measurement of the lead and copper in your drinking water. This sample should represent the water you would typically drink and the faucet from where you drink the water. To best accomplish this goal, select a faucet for sampling that was used the day before you intend to sample. Call your water supply if you have questions.

1. Water must sit idle in the pipes for an extended length of time before sampling. Therefore, do not use any water in the house for at least 6 hours before sampling. The best times to sample are early morning or after returning from work.

2. Select an unfiltered/untreated faucet in the **KITCHEN** or **BATHROOM** that is commonly used for drinking. **DO NOT** sample from a laundry sink or a hose spigot as these samples cannot be used for compliance. **DO NOT** use a faucet that has a filter attached to it unless you bypass the filter. **DO NOT** use a faucet that is connected to a home water treatment device (like a water softener, iron filter, reverse osmosis) unless you bypass the home water treatment device.

3. Place the open sample bottle below the faucet and gently open the **COLD** water tap. If you have a single handle faucet, turn it fully to the **COLD** side. Fill the sample bottle to the neck with the "first draw" of **COLD** water.

4. Tightly cap the sample bottle and place in the sample kit provided. Review the sample kit label to ensure all information contained on the label is complete and correct.

5. Answer the questions on the back of this form and sign the form.

6. Attach this form to the bottle and leave it outside your front door for pick-up.

7. Thank you again for your help. We will send you your individual results within 30 days of receiving them from the laboratory. A summary of information on this year's lead and copper monitoring will be printed in the annual water quality report that will be made available by July 1 of next year. Contact your water supply if you have questions.

If you have questions call:
Water Supply: _____

Manager or
Water Operator: _____

Phone: _____

Or Contact:
Michigan Department of Environmental Quality

DEQ Contact: _____

Phone: _____

TO BE COMPLETED BY RESIDENT/CUSTOMER

A. Which faucet did you use to fill the bottle?

☐ Kitchen ☐ Main bathroom ☐ Other

If OTHER, please describe: _____

_____

B. When was the faucet last used before sampling?

Date _____ TIME _____ AM/PM

Note: If the faucet has been idle more than 24 hours, we might not analyze your sample or be able to use your sample for compliance purposes.

C. When did you fill the bottle?

DATE _____ TIME _____ AM/PM

D. Is there a faucet mount filter? ☐ YES ☐ NO

If YES, was it bypassed? ☐ YES ☐ NO

E. Is this faucet connected to a home treatment device such as a water softener, a reverse osmosis unit, an iron removal device OR is any kind of additive used in the home? ☐ YES ☐ NO

If YES, please describe: _____

_____

Note: If you have a home treatment device OR any kind of additive is used, it is possible we might not analyze your sample or be able to use your sample for compliance purposes.

F. If any plumbing repairs or replacement has been done in the home since the previous sampling event, please note this information here:

If YES, please describe: _____

_____

I have read the Drinking Water Lead and Copper Sampling Instructions and have taken a tap sample in accordance with these directions.

_____

Signature

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Tuesday, January 19, 2016 3:54 PM
To: Kaplan, Robert; Natasha Henderson
Subject: RE: Request for information from last week

Bob,
We may be able to help some with this. I/ll have Mike Prysby send the supplemental operation report that has the water quality parameters analyzed. Not sure that we have the pressure zones however.
On the WEB site we have all the home samples for lead identified by zip code. You can find them at http://www.michigan.gov/flintwater
Go to homes and you'll see the data file. I'll have Mike send the other information first thing tomorrow.

Natasha, If you can identify the pressure zones that would be helpful.

From: Kaplan, Robert [mailto:kaplan.robert@epa.gov]
Sent: Tuesday, January 19, 2016 3:10 PM
To: Natasha Henderson
Cc: Sygo, Jim (DEQ)
Subject: Request for information from last week

Hello Natasha,

Last week I sent the information request in the message below, and I have not heard back from you. I realize that you and your staff are busy dealing with a very difficult situation, and I am sensitive to the fact that this request may seem like just one more thing you are being asked to do. However, I need to stress the importance of us working together and the need we have to see the information your staff are using and/or generating so that we can offer informed assistance.

While all of the information we have identified is needed, it is particularly important that we get as soon as possible existing drinking water quality data we described in #s 2) and 6) of our request:

2) All lead in water testing results for City of Flint, including those not used for Lead and Copper Rule compliance.
6) Identification of the pressure zones and location of each of the water quality parameter locations (addresses) within each pressure zone used for water quality parameter measurements (pH, alkalinity, orthophosphate, chlorine, total Coliform) in the distribution system, along with copies of the water quality parameter analytical results for past 4 rounds of monitoring.

I will call you early next week to find out how we can best get access to this information. I would also like to discuss how we can set up a data sharing process so that we get new data on an ongoing basis as they are generated.

- Bob

Robert Kaplan
Deputy Regional Administrator

U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, January 20, 2016 4:53 PM
To: Sygo, Jim (DEQ); 'Natasha Henderson'
Cc: Henry, Timothy; Nowotarski, Allison
Subject: Task Force Recommendation 16-1 -- Wide Mouth Bottles
Attachments: Use of Wide-mouth Sample Bottles (FTF 16-1).pdf

Jim, Natasha,

Please see Task Force Recommendation No. 16-1 with regard to use of wide mouth bottles in water sampling.

Please call me if you have any questions.

Thank you.

- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
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Flint Drinking Water Task Force (FTF 16-1)

Use of Wide-mouth Sampling Bottles

The EPA Flint Safe Drinking Water Task Force recommends that all samples for lead analyses, whether for lead and copper rule compliance assessment or other purpose, be collected using wide-mouth sample bottles. To best approximate flows from taps in actual day-to-day use, samples should be collected from taps opened fully. Wide-mouth sample bottles better accommodate the resulting higher flows. Wide-mouth sample bottles include 1 liter bottles with opening size of approximately 155 mm or greater and 125 mL bottles with opening size of approximately 20 mm or greater. Sample bottles with opening sizes smaller than described above should not be used for lead sampling.

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, January 20, 2016 5:06 PM
To: Sygo, Jim (DEQ); 'Natasha Henderson'
Cc: Henry, Timothy
Subject: Chlorine residual issue

Jim, Natasha,

I wanted to bring an issue to your urgent attention. It's not a Task Force "recommendation" yet because we do not have all the information. Rather, it's a concern based data we reviewed on chlorine residual levels from various points in the distribution system. We are concerned about low chlorine residual levels shown in some samples.

Task Force members are scheduled to discuss this matter on a conference call 1/21/2016 with Mike Glasgow from the Flint Drinking Water Plant. Task Force members will ascertain what if any actions the City has taken to address the low chlorine residual results, and identify what options are available to the City to increase the chlorine dosage into the system to maintain adequate chlorine residual levels. Task Force members will also discuss other information that may be available to the City about the characteristics of the water in the distribution system that might impact chlorine residuals. The Task Force will offer recommendations as appropriate to the City for adjustments and improvements to address low chlorine residual levels and expects that the City will implement actions to ensure chlorine residual levels are maintained at adequate levels.

- Bob

Cc: Tim Henry

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
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Fax: (312) 692-2075

Marshall, Marjorie

From: Sygo, Jim (DEQ) <SygoJ@michigan.gov>
Sent: Wednesday, January 20, 2016 5:20 PM
To: Kaplan, Robert
Cc: Natasha Henderson; Henry, Timothy; Nowotarski, Allison
Subject: Re: Task Force Recommendation 16-1 -- Wide Mouth Bottles

Bob, we have gone to the wide mouth bottles however we had a limited apply on hand and rather wait for delivery we are temporarily using some narrow mouth bottles.
We have 15000 on back order and will provide them as soon as they com in.

Sent from my iPhone

On Jan 20, 2016, at 5:53 PM, Kaplan, Robert <kaplan.robert@epa.gov> wrote:

> Jim, Natasha,
>
> Please see Task Force Recommendation No. 16-1 with regard to use of wide mouth bottles in water sampling.
>
> Please call me if you have any questions.
>
> Thank you.
>
> - Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

<Use of Wide-mouth Sample Bottles (FTF 16-1).pdf>

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, January 20, 2016 5:23 PM
To: 'Sygo, Jim (DEQ)'
Cc: Natasha Henderson; Henry, Timothy; Nowotarski, Allison
Subject: RE: Task Force Recommendation 16-1 -- Wide Mouth Bottles

That's good news. Thanks for letting me know. We should get the word out – it's become an issue all the way to DC (!).

Thanks.

-- Bob

Robert Kaplan
Deputy Regional Administrator
U.S. EPA Region 5
Phone: (312) 886-1499
Cell: (312) 515-9827
Fax: (312) 692-2075

> **From:** Sygo, Jim (DEQ) [mailto:SygoJ@michigan.gov]
> **Sent:** Wednesday, January 20, 2016 5:20 PM
> **To:** Kaplan, Robert <kaplan.robert@epa.gov>
> **Cc:** Natasha Henderson <nhenderson@cityofflint.com>; Henry, Timothy <henry.timothy@epa.gov>; Nowotarski, Allison <nowotarski.allison@epa.gov>
> **Subject:** Re: Task Force Recommendation 16-1 -- Wide Mouth Bottles
>
> Bob, we have gone to the wide mouth bottles however we had a limited apply on hand and rather wait for delivery we are temporarily using some narrow mouth bottles.
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Fax: (312) 692-2075

<Use of Wide-mouth Sample Bottles (FTF 16-1).pdf>

Kaplan, Robert

From: Kaplan, Robert
Sent: Wednesday, January 20, 2016 8:01 PM
To: Sygo, Jim (DEQ)
Subject: Change in feed rate

Hi Jim, I'd like to talk about a change in phosphate feed rate we heard about. Just want to make sure we're on the same page. Let's talk when you get a chance.

There is something else I'd like to talk about as well. I know it's getting late tonight but call me if you can -- Personal Phone / Ex. 6 If not, let's talk Thursday. Thanks,

Bob